THE JOURNAL OF INDUSTRIAL ECONOMICS

Volume II

1953-4

BASIL BLACKWELL
OXFORD

BOARD OF EDITORS

P. W. S. Andrews (General Editor): Official Fellow of Nuffield College, Oxford.

Sir Henry Clay: Honorary Fellow and formerly Warden of Nuffield College, Oxford.

Professor Joel Dean: Professor of Business Economics, Columbia University, and Partner, Joel Dean Associates.

Professor R. B. Heflebower: Professor of Economics, Northwestern University.

Professor John Jewkes, C.B.E.: Professor of Economic Organization, University of Oxford.

Professor E. S. Mason: Dean, Graduate School of Public Administration and Professor of Economics, Harvard University.

Secretary and Editorial Assistant: Elizabeth Brunner.

ENGLISH LAW AND MONOPOLISTIC PRACTICES

by C. A. Cooke

1. *Introduction.* The question I shall try to answer in this article is how far the law of England today allows trade practices which the economist would describe as monopolistic. It is not necessary, fortunately, for me to define monopoly, for, although the word occurs in the relevant Law Reports from time to time, the law itself is content with the less formidable title of restraint of trade. For the present legal position has developed historically, precedent broadening down through precedent, from the general proposition drawn from the Statute of Monopolies[1] and the famous case of Darcy v. Alleyn,[2] that a combination of traders to interfere with the natural interaction of supply and demand was against the public interest. That was at the beginning of the seventeenth century. Not until the nineteenth century did a concept of trade combination which is not against public policy emerge in legal doctrine.

In looking at the historical development of the law relating to restraint of trade, it must always be remembered that ecomomic theory is not the province of the lawyer or of courts of law. In dealing with trade and industry the law must postulate certain assumptions from which legal discussion begins, and it has to seek those postulates within the law itself. A court has to deal with a dispute between two legal persons; it cannot, in deciding that dispute, take evidence as to what the economic system is or should be at any particular time, and the evidence would be of little service if it could be taken. The common custom or practice of merchants may be accepted, as it was by Lord Mansfield in building up the law of contract in the eighteenth century. But this is because custom is a valid source of law and the maintenance of good faith among traders is assumed to be an end of law. In short, the law courts must administer the law in the economic system as they find it; they can determine the law, but they must take the system for granted. Thus both decisions of the courts and professional legal scholarship are, in any period, superposed on the prevailing political and economic assumptions of the society they assist in governing, and the emanating legal doctrines are necessarily tinged with these assumptions.

The interpretation of the common law doctrine on restraint of trade may be divided historically into at least three stages of economic assumption.[3] In the first stage, although competition was in

[1] 21 Jac 1, c. 3 (1624). [2] 11 Coke 84 (1602).
[3] Sir F. Pollock, *The Genius of the Common Law*, pp. 107-8.

favour, the law did not seek to establish unlimited competition between all men. The early merchant or manufacturer must have served an apprenticeship; only when qualified did he become free to exercise the 'lawful mistery' of his calling for the public good. He then had a right to exercise his trade which the law would defend, but also a duty to the commonwealth which the law would demand. The privileges of his position must not be abused by those practices which would result in the raising of prices, known to the common law as regrating, forestalling and engrossing.[4] In such cases the law would denounce the abuse as it did in the Lombard's case,[5] the case of the craftsmen of Ware,[6] or that of the chandlers of Norwich.[7] And later, with the experience of Tudor monopolies fresh in mind, the courts developed an extreme jealousy of all agreements and covenants which endeavoured to restrain the actions of an individual in the exercise of his trade. The sole breaches in the defences were the patent rights granted by the Crown to inventors or to companies and the recognition that the man who bought the goodwill of a business was entitled to some reasonable protection against the competition of the seller.

The next stage of economic assumption tended more to the protection of freedom of contract, dominated by Bentham's utilitarianism and Austin's application of it to legal analysis. Only in the Chancery courts was there any expansion of legally permissible restraint of trade. But since the eighteen-seventies the courts have moved steadily towards a conception of restraint of trade which is permissible, provided that it is used reasonably, although 'the parties are the best judges of what is reasonable between themselves'.[8] Lord Justice Bowen said in 1889 that 'if peaceable and honest combinations of capital for purposes of trade competition are to be struck at, it must, I think, be by legislation, for I do not see that they come under the ban of the common law'.[9] Since the case he was discussing concerned a combination with the aim of raising prices in the freight market, the interpretation of the common law had thus turned to face the opposite way since the days in which the Lombard, the craftsmen of Ware and the chandlers of Norwich had stood their trials for that very conduct.

So far as the law of the land is concerned the Monopolies and Restrictive Practices Act of 1948 has not altered the doctrine of

[4] Made Statutory in 1552: 5 and 6 Edw. VI, c. 14.
[5] 1368: Coke. 3 Inst. 196.
[6] 1354: King's Bench Ancient Indictments, 38m. 22d.
[7] Leet Jurisdiction in Norwich, pp. 30, 47, 63, 65.
[8] Haldane, L. C. in North Western Salt Coy. v. Electrolytic Alkali Coy. (1914). A.C., p. 461.
[9] Mogul Steamship Coy. v. Macgregor Gow & Co. (1889). 23 Q.B.D. 617.

restraint of trade as applied in the courts. That Act sets up an investigating commission which deals only with trades or firms specifically referred to it by the President of the Board of Trade. Its duty is to report to the President with (if he so requests) recommendations to end any 'mischief' discovered. A Minister concerned with economic affairs may then put before Parliament an order which may declare a specified practice unlawful 'either for all persons or for such persons as may be specified or described in the order'. The order takes effect unless there is a prayer against it; that is to say, it has not to be proposed to Parliament but may only be opposed, and if not opposed is approved. With the business of the commission the law courts have no concern and on the other hand the commission is not concerned with the legal doctrines of restraint of trade; it is merely a fact finding body which has to devise its own criteria for the assessment of 'mischief' and 'the public interest'. Its work is, therefore, of little relevance to the present essay, except in so far as the construction by Statute of such an investigating body points the moral of Lord Justice Bowen's remark of sixty years earlier. The constitution and terms of reference of the Monopolies Commission indeed reflect a dilemma of the age; that some degree of combination (perhaps to be described as peaceable, honest and reasonable) is desirable from the economists' point of view; but that combinations of capital are still at least as suspect as they were to Adam Smith.

2. *The Criminal Law and Monopoly.* Blackstone, in the Commentaries, describes three offences which are tinged with monopoly — forestalling, regrating and engrossing. Forestalling was described in a Statute of 1552[10] as the buying or contracting for any merchandise or victual coming to market, or dissuading persons from bringing their goods or provisions there, or persuading them to enhance the price when there; any of which practices make the market dearer. Regrating was described by the same Statute to be the buying of corn or other dead victual in any market and selling it again in the same market. For this also enhances the price, since every successive seller must have a successive profit. Engrossing was described to be the getting into one's possession, or buying up, of large quantities of corn or other dead victuals with intent to sell them again. This must be injurious to the public (says Blackstone) by putting it in the power of one or two rich men to raise the price of provisions at their own direction. Now, although these offences became statutory by the Act of 1552 they were also common law offences. So that when the

[10] 5 and 6 Edw. VI, c. 14.

Statute of Edward VI was repealed in 1772[11] Blackstone notes that they revived as common law offences, with penalties, as in other misdemeanours, of discretionary fine and imprisonment.

The three offences were abolished in 1844[12] by the flooding tide of Benthamite reform and in the name of freedom of contract. But in passing it is to be noted that, while the Statute of 1552 was good law in the American colonies and was likewise repealed there by the Act of 1772, the common law offences of regrating, forestalling and engrossing have never been abolished in the United States. 'We must hold it to be indictable on general principles of common law to engross and absorb any particular necessary staple or constituent of life so as to impoverish or distress the mass of the community for the purpose of extorting by terror or other coercive means, prices greatly above the real value. Questions of this kind have usually come before the courts on indictments for conspiracy; for it is by conspiracies that extortions of this kind are generally wrought. But on an indictment against an individual for buying up all the grain or other necessary staple so as to produce a famine in the market and thus to obtain greatly extortionate prices, wrung through a sense of misery from the community, the offence may be held indictable at common law.'[13]

Conspiracy is the agreement of two or more persons to effect any unlawful purpose, whether as their ultimate aim or only as a means to it. It follows, therefore, that, until the repealing Act of 1844, a combination to enhance prices by forestalling, regrating or engrossing would be indictable in England as a conspiracy. This was recognized in several judgments in the seventeenth and eighteenth centuries.[14] Lord Mansfield said in 1783: 'The illegal combination is the gist of the offence; persons in possession of any particular articles of trade may sell them at such prices as they individually may please but if they confederate and agree not to sell them under certain prices, it is a conspiracy.'[15] If this was the position taken by the law before the Act of 1844 abolished the offences, the position today is, to say the least, very curious. For by the Statute Law Revision Act of 1892[16] the Act of 1844 was repealed, quietly and without comment, as one that had served its purpose and was now dead matter on the Statute Book. It is a well-known principle that on the repeal of a statute the law relating to that particular field

[11] 12 Geo. III, c. 71. [12] 7 and 8 Vict., c. 24.
[13] Wharton, *Criminal Law*, 4th ed., pp. 2210-11.
[14] e.g. R. v. Sterling (1664), 1. Sid. 174, 1 Kebl. 650. R. v. Twistleton (1662), 1. Sid. 387, 1 Lev. 257.
[15] R. v. Eccles, 1 Leach, 274 (1783).
[16] 55 and 56 Vict., c. 19.

reverts to the state in which it was before the repealed statute was passed. If this principle applies to the field of price fixing, and there has been no reason why it should not, then, since 1892 the three offences defined by Blackstone have been offences that can be committed by individuals and by limited companies. Further, a group of individuals or companies acting in association to cause the prices of their products to be raised would be conspiring together to commit a common law offence and therefore indictable for the separate crime of conspiracy. That there have been no prosecutions under the common law since 1892 may make it improbable that there will be prosecutions in the future. After 1772 Lords Kenyon and Mansfield acted boldly to revive the common law — and if then, why not today? The point is more than merely academic, for in the United States the three common law offences were a stout weapon in the defence of the public interest just before the anti-trust legislation of the eighteen-nineties. One must as least qualify the view that the criminal law is weaponless against monopoly in England.

It would, however, be wrong to suggest that in practice there is any present limitation on the market policies of business in England. For many years manufacturers and traders, corporations and individuals, have refused to sell at their pleasure, have sold only on conditions prescribed by them, and have fixed prices as they thought fit. They have combined together; they have established monopolies of various kinds; and none of these things have been the spring of a criminal prosecution. There was for a short while an Act, born of war experience, empowering the Board of Trade to investigate unreasonable profits and to prosecute in such cases in courts of summary jurisdiction.[17] But this tenderness to the consumer was soon lost; after the trade boom of 1920 had collapsed in the depression of 1921 the Act passed into a trance-like state of moribund desuetude, and the body was quietly buried in 1927.[18]

The new procedure, of investigation by the Monopolies Commission and report to the President of the Board of Trade, provides for an Order, approved by Parliament, declaring certain practices, to be specified in the Order, illegal. The test of criminality in such a case is a simple one — 'the force of Mephisto pronouncing a ban'. But the Commission has the painful work of deciding whether such a course should be recommended, and the criteria to be applied in that assessment are neither clear nor easy. It is, indeed, admitted that the simple solution of the common law — that the raising of prices is a crime — is as outmoded today as it was when Bentham

[17] The Profiteering Act, 1919. (9 and 10 Geo. V, c. 66.)
[18] By the Statute Law Revision Act, 1927. (17 and 18 Geo. V, c. 42.)

attacked it and that other and more intangible measurements must be attempted if the question of whether a particular price level is against the public interest is to be answered.

Some light can be thrown on the problem from the purely legal side. Two criminal prosecutions of corporations for offences arising from monopolistic practices have been considered in modern times by the Judicial Committee of the Privy Council. Both cases arose from special statutes passed in the Dominions and came to the Committee on appeal. The first was that of the Attorney-General for Australia v. The Adelaide Steamship Company,[19] a prosecution under the Australian Industries Preservation Acts, 1906-1910. The defendants were charged under sections of the Acts which provided that combinations in restraint of trade and attempts to establish monopolies 'to the detriment of the public' constituted an indictable offence. The defendants were parties to a coal-producing cartel for which they acted as agents, buying exclusively from the cartel and selling at fixed prices. The defendants were convicted in the Court of first instance, but on appeal it was held that no detriment to the public had been proved and this view was upheld by the Judicial Committee.

The opinion of the Committee contains a point of some significance, for it shows that the idea of price as the test of public policy was already fading from the law in 1913. Lord Parker of Waddington said that 'it can never, in their Lordships' opinion, be of real benefit to the consumers of coal that the colliery proprietors should carry on their business at a loss or that any profit they make should depend on the miners' wages being reduced to a minimum. Where these conditions prevail, the less remunerative colleries will be closed down, there will be a great loss of capital, miners will be thrown out of employment, less coal will be produced and prices will consequently rise until it becomes possible to reopen the closed collieries or open other seams. The consumers of coal will lose in the long run if the colliery proprietors do not make a fair profit or the miners do not receive fair wages'.[20]

Lord Parker's argument is, therefore, that competition in the New South Wales coal trade was so fierce as to force down wages and bring about the closing of the least efficient collieries. The result of this process would be a fall in the production of coal and a rise in its price to the consumer. But the fact that a colliery has been forced out of business by competition means that its market has been captured by a competitor able and willing to undersell it. Lord Parker seems to assume that the quantity of coal produced in the coal

[19] 1913, A.C. 781. [20] 1913, A.C. 781, 801.

field remains constant throughout the competitive struggle, in which case there would, clearly, be no competition unless the market was contracting. The evidence, on the contrary, showed a steady market and a steady rise in prices due to the cartel's success in controlling output. In fact, therefore, just those things were happening from which the Judicial Committee determined that the Australian public must be saved.

No one will deny one part of Lord Parker's argument. The proposition that coal consumers will lose in the long run if collieries do not make profits and miners do not receive fair wages can be accepted. But the assumption that the retention in production of inefficient colleries is the way to preserve profits and wages is untenable. The determination of whether or no the cartel scheme was 'to the detriment of the public' rests on three factors; the course of demand for coal, the degree of monopoly possessed by the cartel, and the effect on prices of changes in output. Sales, output and prices before and during the cartel's existence were the economic evidence necessary to demonstrate the detriment, if any, brought about by the cartel's tactics.

A New Zealand case throws further light on the Judicial Committee's reasoning. The Commercial Trusts Act, 1910, of New Zealand,[21] is similar in content to the Australian Act and a successful prosecution under it had been upheld in the New Zealand Court of Appeal.[22] The circumstance of this prosecution was a system of discounts by which an association of merchants obtained control of the distribution of sugar in the Dominion. The practices of the association came within the Act as a conspiracy to create a monopoly contrary to the public interest. And the New Zealand Court tackled the problem of what constitutes the public interest as one of fact. The effect of monopoly and control of the market, said the Court, was to keep up the price of sugar to the general public when it would, without that monopoly and control, have been reduced. Such a monopoly would only be justified if it were 'reasonably necessary in order to prevent the destruction or crippling of an important local industry'. Alternatively, 'if it is reasonably necessary in order to secure the efficient and economical distribution of the product, the monopoly might not be contrary to the public interest although it tended to keep up prices'. On the facts of the case the Court found that the monopoly of the sugar merchants did not satisfy either of these tests and their appeal against conviction was dismissed.

[21] New Zealand Statutes, 1 Geo. V, 32.
[22] The King v. the Merchants' Association of New Zealand. 32 New Zealand Law Reports, p. 1233.

attacked it and that other and more intangible measurements must be attempted if the question of whether a particular price level is against the public interest is to be answered.

Some light can be thrown on the problem from the purely legal side. Two criminal prosecutions of corporations for offences arising from monopolistic practices have been considered in modern times by the Judicial Committee of the Privy Council. Both cases arose from special statutes passed in the Dominions and came to the Committee on appeal. The first was that of the Attorney-General for Australia v. The Adelaide Steamship Company,[18] a prosecution under the Australian Industries Preservation Acts, 1906-1910. The defendants were charged under sections of the Acts which provided that combinations in restraint of trade and attempts to establish monopolies 'to the detriment of the public' constituted an indictable offence. The defendants were parties to a coal-producing cartel for which they acted as agents, buying exclusively from the cartel and selling at fixed prices. The defendants were convicted in the Court of first instance, but on appeal it was held that no detriment to the public had been proved and this view was upheld by the Judicial Committee.

The opinion of the Committee contains a point of some significance, for it shows that the idea of price as the test of public policy was already fading from the law in 1913. Lord Parker of Waddington said that 'it can never, in their Lordships' opinion, be of real benefit to the consumers of coal that the colliery proprietors should carry on their business at a loss or that any profit they make should depend on the miners' wages being reduced to a minimum. Where these conditions prevail, the less remunerative colleries will be closed down, there will be a great loss of capital, miners will be thrown out of employment, less coal will be produced and prices will consequently rise until it becomes possible to reopen the closed collieries or open other seams. The consumers of coal will lose in the long run if the colliery proprietors do not make a fair profit or the miners do not receive fair wages'.[19]

Lord Parker's argument is, therefore, that competition in the New South Wales coal trade was so fierce as to force down wages and bring about the closing of the least efficient collieries. The result of this process would be a fall in the production of coal and a rise in its price to the consumer. But the fact that a colliery has been forced out of business by competition means that its market has been captured by a competitor able and willing to undersell it. Lord Parker seems to assume that the quantity of coal produced in the coal

[18] 1913, A.C. 781. [19] 1913, A.C. 781, 801.

field remains constant throughout the competitive struggle, in which case there would, clearly, be no competition unless the market was contracting. The evidence, on the contrary, showed a steady market and a steady rise in prices due to the cartel's success in controlling output. In fact, therefore, just those things were happening from which the Judicial Committee determined that the Australian public must be saved.

No one will deny one part of Lord Parker's argument. The proposition that coal consumers will lose in the long run if collieries do not make profits and miners do not receive fair wages can be accepted. But the assumption that the retention in production of inefficient colleries is the way to preserve profits and wages is untenable. The determination of whether or no the cartel scheme was 'to the detriment of the public' rests on three factors; the course of demand for coal, the degree of monopoly possessed by the cartel, and the effect on prices of changes in output. Sales, output and prices before and during the cartel's existence were the economic evidence necessary to demonstrate the detriment, if any, brought about by the cartel's tactics.

A New Zealand case throws further light on the Judicial Committee's reasoning. The Commercial Trusts Act, 1910, of New Zealand,[21] is similar in content to the Australian Act and a successful prosecution under it had been upheld in the New Zealand Court of Appeal.[22] The circumstance of this prosecution was a system of discounts by which an association of merchants obtained control of the distribution of sugar in the Dominion. The practices of the association came within the Act as a conspiracy to create a monopoly contrary to the public interest. And the New Zealand Court tackled the problem of what constitutes the public interest as one of fact. The effect of monopoly and control of the market, said the Court, was to keep up the price of sugar to the general public when it would, without that monopoly and control, have been reduced. Such a monopoly would only be justified if it were 'reasonably necessary in order to prevent the destruction or crippling of an important local industry'. Alternatively, 'if it is reasonably necessary in order to secure the efficient and economical distribution of the product, the monopoly might not be contrary to the public interest although it tended to keep up prices'. On the facts of the case the Court found that the monopoly of the sugar merchants did not satisfy either of these tests and their appeal against conviction was dismissed.

[21] New Zealand Statutes, 1 Geo. V, 32.
[22] The King v. the Merchants' Association of New Zealand. 32 New Zealand Law Reports, p. 1233.

But when a later case[23] came on appeal to the Judicial Committee of the Privy Council the Committee hardly did the New Zealand Court the courtesy of an attempt to understand its judgment. That Court had held on the facts that there was a monopoly which eliminated competition, restricted output and raised prices, and that therefore the defendants had been properly convicted. The Judicial Committee took the view that it must 'decline to adjudicate between conflicting theories of political economy' — which it was not asked to do — and reversed the decision of the New Zealand Court of Appeal. In the view of the Committee the public interest was a matter of law and not of fact and, since the Commercial Trusts Act contained no express definition of that phrase in terms of law, there could be no ground for conviction. This decision of the Committee was, of course, consistent with its decision in the Australian case. But it may be noted in passing that very soon afterwards the New Zealand Government imposed a stringent system of regulation on sugar prices.[24]

On these decisions of the highest court of English law it seems clear that no form of economic association designed to control a market is illegal in English law, no matter how high it raises prices, how much it controls supply or to what extent it oppresses the general consumer. 'Public policy' and 'the public interest' have failed to protect the public from the 'peaceable and honest combinations of capital'. The criminal law does not forbid monopoly.

3. *The Tort of Conspiracy.* It would be much too simple for any legal system merely to say that every wrong has its remedy. 'Ubi jus, ibi remedium' is by no means the same thing; 'jus' in particular must be delicately construed. One of the first things the student learns of the law of tort (after absorbing the indefinability of tort) is that *damnum absque injurio* is not actionable, but that *injuria sine damno* is. All that these maxims come to is this; no action lies for mere damage, however substantial, caused by some act which does not violate a legal right; but an action does lie for interference with another's absolute legal private right, even where it causes no actual damage. Consequently, rights within the meaning of the maxim are Ihering's legally protected interests and only those.

Assuming a violation of such a right, one or more of several remedies may be applied by the law. There may be a civil action for damages; an injunction, specific restitution, or the payment of

[23] R. v. Crown Milling Co. Ltd., 1927, A.C. 394.
[24] See W. B. Sutch, *Price Fixing in New Zealand*, pp. 30-47.

money by way of penalty. If the practice and tradition of the common law sanction a remedy by a civil action for damages, the wrong is a tort; in the other cases it is a civil wrong closely akin to tort but, since the remedies applied are equitable, not a tort of impeccable vintage. This not exactly logical way of defining a thing, by saying what you can do if it is what you say it is, makes exact delineation of the boundaries of tort impossible. But it has allowed a remarkable freedom of development to the idea of tort. The common law remedies for tort cannot be considered alone, particularly in relation to the torts arising from economic association. The equitable remedies must be added as they develop, for one historical tendency has been to turn to the restraint of tort feasance by injunction.

When the law approached combinations of men from the angle of tort the very nature of the approach prevented it falling into the error of the criminal law. From the first, the behaviour of the combination was the crux of the matter. It could never, by its mere existence, commit a tort; there must be some active violation of a private right to constitute a tort. Mere combination, though it may be criminal, cannot be actionable in tort. Thus economic association in the eye of this branch of the law must necessarily be treated from the angle of behaviour. Intent and purpose are the decisive factors; a proposition which brings equity, acting according to conscience and *in personam*, hastening to the aid of the party.

The one injury a tradesman might suffer in relation to his trade for which the common law provided a remedy was the inducement of breach of contract between a master and his servant. 'For every master has by his contract purchased for a valuable consideration the service of his domestics for a limited time; the inveigling or hiring his servant, which induces a breach of this contract, is therefore an injury to the master; and for that injury the law has given him a remedy by a special action on the case: and he may also have an action against the servant for the non-performance of his agreement.'[25] The person or persons inducing the breach of contract must be aware of the contract; that is to say, their intent must be to induce a breach and not merely to engage the servant. There does not appear in Blackstone's day to have been a corresponding tort where breach of a trading contract was induced by a third party. The reason, perhaps, is that the servant, as compared with his master, was an undesirable defendant to an action for damages. To find a more substantial defendant would guarantee a remedy, and the common law was essentially concerned with practical remedies.

[25] Blackstone, Comm. III. 8, 121.

If the servant was enticed from his employment, the law sought the true villain of the piece. But trading contracts were presumed to be between men of substance; if they were not, then the man who entered into commercial relations with a man of little credit and standing had only himself to blame. Thus, if a breach of a trading contract was induced by a third party, an adequate remedy could be obtained by proceeding against the party actually breaking the contract.

Blackstone notes that, with one exception, a man cannot claim the assistance of the law in repelling the trade competition of rivals. Drawing upon Sir Matthew Hale's opinion, he remarks that the holder by enfranchisement or prescription of a public service such as a market, fair or ferry, may claim freedom from competition and has an action for trespass on the case if he is damaged by the activity of a new market, fair or ferry.[26] 'But where the reason ceases the law also ceases with it: therefore it is no nuisance to erect a mill so near mine, as to draw away the custom, unless the miller also intercepts the water. Neither is it a nuisance to set up any trade, or a school, in neighbourhood or rivalship with another, for by such emulation the public are like to be gainers; and, if the new mill or school occasion a damage to the old one, it is *damnum absque injuria*.'[27]

The law of tort was undergoing its main development and the principles of it were being settled towards the end of the eighteenth century and in the early years of the nineteenth. These principles dealt with trade only in matters where clear trespass could be brought into the case; the law of contract was left to found the ethics of business. The criminal law protected the trader against 'deceitful practice in cozening another by artful means'.[28] But there was no protection against the power of trade competitors. The doctrines of tort were 'principles peculiarly adapted to a community which was predominantly rural and in which each man was more or less self-sufficient'.[29] These doctrines did not, because they could not, allow for an unforeseen series of changes in the system and structure of manufacturing and trading. They left with the individual business man the responsibility for building up his business and protecting it by the exercise of his own skill and foresight, safeguarded only against deception and fraud considered as public wrongs or as going to the root of the contractual relation.

The law of tort is still based largely on the conception of a direct relationship between the injured person and the party inflicting the

[26] Blackstone, Comm. III, 13, 180a. [27] Ibid.
[28] Blackstone, Comm. IV, 12, 5.
[29] A. L. Goodhart, *Essays in Jurisprudence and the Common Law*. 'Present Tendencies in English Jurisprudence', p. 36.

injury. At the beginning of the nineteenth century it was exclusively based on the postulate of such a relationship. The consequences of this personal connection between the actual damage and the act or omission which caused it are to be seen in the law of negligence, in which the common law courts have consistently endeavoured to maintain a limit to the pursuit of damages.

By far the greatest number of commercial dealings are concerned with the contractual relationships of buying and selling. There is no direct economic connection between competing firms; competitive tactics are concerned solely with third parties. If to any extent competitors have dealings with each other, they cease to be competitors in the particular legal relation created, coming under the law of contract or the law of criminal conspiracy. As competitors, they face a common market and deal with the group of buyers (or sellers) opposite them both. But it is through this group, through their methods of business, price and policy and contract terms in dealing with the market, that competitors in modern commerce most effectively damage each other. On the tactics of business competition the law of tort had little to say until some direct link between the injured party and the party responsible for the wrongful act could be established.

This link was formed by an extension of the common law tort of inducing a servant to break his contract of service. The rule was widened until it applied to all contracts, so that to induce a man to break his contract with another man was to render oneself liable in damages in an action for trespass. This general proposition applying the doctrine of tort to breach of contract was not established without a good deal of controversy and in its full extension it is of twentieth-century creation. The step from the master-servant relation was taken only in the middle of the nineteenth century in a contract of service,[10] in which an opera singer was induced to break her contract to appear. The extension of this kind of relation to contracts for services between equals having taken place, there seemed no reason why contracts between equals for the sale of goods should not also be protected from the blandishments of third parties. That it is a tort to induce a breach of contract of service so that one of the parties suffers damage has been firmly established by the highest judicial authority.[11]

As trade unions in England were becoming free from the criminal law, they became enmeshed in this tort. The members were to some

[10] Lumley v. Gye, 2 E. and B. 216.

[11] In the court of Appeal, Bowen v. Hall, 6 Q.B.D. 333 (C.A.), 1881. In the House of Lords, Quinn v. Leathem (1901) A.C. 495. In the Privy Council, Jasperson v. Dominion Tobacco Co. (1923), A.C. 709.

extent protected, as individuals, by the fact that it has never been held to be actionable merely to induce another person not to enter into a contract or lawfully to terminate a contract, even if it is done maliciously and with intent to cause damage to the other party to the negotiations or the contract. The Master and Servant Act, 1867,[32] had freed workmen breaking their contracts from summary arrest and imprisonment, but it did not free the workmen's leaders from tort when they induced the breaches. In 1875, however, the Master and Servant Act was repealed and replaced by the Employers and Workmen Act,[33] which in effect accomplished the legal movement of servants from status to contract in the best tradition of Sir Henry Maine's dictum. But, as the tort of inducing breach of contract had already passed beyond its eighteenth-century confines of menial employment, the Act of 1875 did not do more than provide a statutory reason why breach of all contracts should be considered from the angle of tort. With a common law precedent for extension already established in Lumley v. Gye[34] the implications of the statute were not considered save in the limited field of contract. The relation of economic status to the old law of tort was overlooked altogether.

So the criminal approach to trade union activities was abandoned towards the end of the nineteenth century, and the law of tort came into play against them. The courts began to hold the officers of trade unions personally liable in damages where it could be proved that they had used their influence to the detriment of the employers' interest or to that of any other workmen.[35] In the case of Temperton v. Russell,[36] the defendants wished to induce the plaintiff to carry on his trade in a manner agreeable to a trade union. To accomplish this end they induced a third party to break a contract with the plaintiff for the supply of materials. The plaintiff suffered damage thereby and brought an action in tort, in which the defendants were held liable. It was also held that the action lay against the officials of the unions concerned[37] and not against the trade unions themselves; this because of the peculiar unincorporated and extra-legal status conferred on them by the Trade Union Act, 1871.[38]

In the first year of the twentieth century the question of the liability of a trade union in tort for inducing breach of contract came finally to a head. The law began by abandoning the idea that corporate personality was necessary before an association could be sued in tort. It did so by the application of an old rule of equity

[32] 30 and 31 Vict., c. 141.
[33] 38 and 39 Vict., c. 90.
[34] 2 E. and B. 216.
[35] *Freedom of Association*, vol. II, p. 17.
[36] (1893), Q.B. 715 C.A.
[37] Three unions were actually involved.
[38] 34 and 35 Vict., c. 31.

which had been pleaded by the defence in Temperton v. Russell without acceptance by the Court. It had long been the practice of the Court of Chancery that where there were numerous parties having the same interest in one cause or matter, one or more of the persons concerned may sue or be sued, or may be authorized by the court to defend the cause on behalf or for the benefit of all the parties interested. In 1883 this rule was adopted by the Supreme Court.[39] Ten years later the Court of Appeal held that the rule did not apply to trade unions, but only to parties having or claiming to have a beneficial proprietary right which they were asserting or defending. This decision was overruled in 1901, when the House of Lords held that the rule applied in all cases of common interest.[40] Consequently an action in tort could be brought against the officials of a trade union as representatives of all its members, damages to be met from the common funds. The law thus recognized the fact of association as creating peculiar corporate responsibilities even where there was no incorporation and therefore no corporate personality.

This sudden recognition of a corporate responsibility for tort where no corporation existed was applied within a few weeks in the Taff Vale decision, which laid down that where an association of men which can inflict injuries on other parties had been authorized by Parliament, it must be implied that Parliament, in allowing the existence of the association, also intended that the association should be suable in a court of law, for injuries done purposely, by its authority. In this case the employees to the Taff Vale Railway Company had come out on strike and in the course of the strike certain unlawful acts were committed. The railway company thereupon sued the trade union responsible in tort for conspiracy to induce workmen to break their contracts and to interfere with the business of the company by picketing and other means. Farwell, J., granted an interim injunction against the defendants; they appealed, to lose in the House of Lords.[41] The Law Lords held that since the Trade Union Act, 1871, conferred on a registered trade union the privileges of corporate association it also (though the act never mentions the fact) conferred upon them the privilege of corporate liability. Lords Macnaghten and Lindley, however, concurred in the judgment on more general grounds, holding that corporate liability arose quite apart from the 1871 act and that if an association, registered or unregistered, incorporated or unincorporated, injured another party, the association could be sued in tort through its representatives.

[39] Order No. XVI, Rule 9.
[40] Duke of Bedford v. Ellis (1901), A.C. 1.
[41] Taff Vale Railway Company v. Amalgamated Society of Railway Servants (1901), A.C. 426.

Shortly afterwards another trade union case came to the House of Lords, from Ireland. In this case[41] the officials of a union of butchers' assistants endeavoured to coerce an employer, A, into ceasing to employ non-union labour by informing a large customer, B, of the employer's, also a butcher, that unless A ceased to employ non-union labour, on the arrival at B's premises of a consignment of meat from A the union labour employed by B would immediately be called out on strike. Thereupon B terminated his dealings with A, who suffered considerable loss in consequence. The House of Lords held that a combination of two or more without justification or excuse to injure a man in his trade by inducing his customers or servants to break their contracts with him or not to deal with him or continue in his employment is, if it results in damage to him, actionable. Lord Halsbury went so far as to say that if on the facts the plaintiff could have no remedy against those who had injured him, it could hardly be said that our jurisprudence was that of a civilized community.

Notwithstanding Lord Halsbury's opinion a general election and a change of party in power decivilized our jurisprudence. Under pressure from the organized trade unions of England the Liberal Government carried through Parliament the Trade Disputes Act, 1906.[42] This Act expressly gave trade unions immunity, both as corporations and in the persons of the officials, from being suable in tort in respect of any wrongful act committed by or on behalf of the trade union. It was also provided that an act done in contemplation or in furtherance of a trade dispute should no longer be actionable on the ground only that it induced some other person to break a contract of employment, or that it was an interference with the trade, business or employment of some person, or the right of some other person to dispose of his labour and capital as he willed. Nor, in future, was an act, done in pursuance of an agreement or combination in contemplation or furtherance of a trade dispute, to be actionable unless it would be actionable if it had been done without any agreement or combination.

Whether or no the Law Lords were right in their interpretation of the unexpressed intentions of the legislature in 1871, there can be no mistake about the intention of Parliament thirty-five years later. The decisions in the Taff Vale case and in Leathem's case were both set aside and it was made plain that what had been given by removing the restrictions imposed by criminal law on the economic association of workmen was not to be removed by the cultivation from an ancient tort, of civil penalties on trade union activities. Nor has subsequent legislation materially altered the balance of economic

[41] Quinn v. Leathem (1901), A.C. 495. [42] 6 Ed. VII, c. 47.

bargaining power established by the Act of 1906. The Trade Disputes and Trade Unions Act, 1927,[44] made it an offence to take part in a strike or lock out which had any object other than the furtherance of a trade dispute within the industry in which the participants were engaged or was designed 'to coerce the Government'. It also provided that the Attorney-General might apply for an injunction restraining the use of trade union funds in an illegal strike, and that the provisions of the Trade Disputes Act, 1906, should not apply to acts in furtherance of an illegal strike. The net result was a limitation of the 'right to strike' in order to prevent a general strike which would be illegal and would give rise to torts. The Act of 1927 was, in fact, aimed at one political phase of trade unionism and not at a form of economic association. As a method of collective bargaining for fixing conditions of employment the trade union remained free alike of criminal and tortious liability, and the Act of 1927 was repealed by the Trade Disputes and Trade Unions Act, 1946.

In Quinn v. Leathem the weapon applied by the union to the recalcitrant employer was the boycott; a refusal to handle his goods to the detriment of his trade and the damage of his contracts. The fact that the boycott was applied by a trade union had its peculiar repercussions in trade union law, but since boycotts may also be applied by economic associations of capital, Quinn v. Leathem has its importance in this field also. All competitive trading is intended to benefit one business by taking trade from and therefore damaging others. At what point does the infliction of damage by an economic association, formed as part of competitive tactics, cease to be justifiable and become an actionable wrong?

There is no difficulty as long as the actions of an individual only are in question. 'A man has the right to trade as he pleases. A manufacturer or merchant may refuse to sell his goods to anyone who wishes to buy them, or he may sell them on such conditions as he thinks fit to impose.'[45] But to procure breach of contract by fraud, or by unlawful means to cause persons not to have, or to cease to have, dealings with a third person — these are tortious acts which give the third person a right of action.[46] It is settled, on the other hand, that where the lawful termination of a contract is induced without an illegal act and without unlawful means, then, no matter

[44] 17 and 18 Geo. V, c. 22.

[45] Committee on Restraint of Trade, 1931; *Report*, p. 5.

[46] Temperton v. Russell (1893) 1 Q.B. 715 (C.A.). National Phonograph Co. v. Edison Bell Consolidated Phonograph Co. (1908), 1 Ch. 335 (C.A.). G.W.K. Ltd. v. Dunlop Rubber Co. (1926), 42 T.L.R., 376, 593. See also Tarleton v. M'Gawley (1793), 1 Peake, 205. Garrett v. Taylor (1620), 1 Cro. Jac. 567.

how malicious or bad the motive of the individual procuring the termination may be, no action lies against him on the part of parties injured in consequence of his action.[47] An individual, therefore, whether an actual person or the fictitious legal person born of incorporation, can pursue his trade interests even to a high degree of monopoly and the damage of the public without tortious responsibility. At the other end of the competitive range, the individual can persuade, by cajolery, blandishment, rebates, special discounts, warnings of refusal of certain supplies and any other means that do not infringe the law, the customers of his competitors to deal with him alone. The idea, which at one time prevailed, that any act which interfered with another in carrying on his trade (which can be predicted of every act of successful competition) was *prima facie* actionable and had to be justified, or, as it was also put, was wrongful if not done with just cause or excuse, must be regarded as erroneous.

The emancipation of the individual from this idea has not been extended to combinations of individuals; that is to say, to unincorporated associations of human persons or of corporations acting in concert. Since unincorporated associations of persons are almost wholly associations of workmen and come under the special developments of trade union law, the tort by interference has been, since 1906, virtually confined to associations of capital, acting to promote what are conceived to be the general interests of the association. But from Quinn v. Leathem the proposition is derived that a combination of two or more, without justification or excuse, to injure a man in his trade by inducing his customers or servants to break their contracts with him, or not to deal with him, or not to continue in his employment is, if it results in damage to him, actionable. And this rule appears to extend beyond the inducement of breach to damage resulting from the lawful termination of contracts; damage, that is to say, to what the American jurists have called the 'expectancy' of a business regarded as a going concern. English law has always regarded a combination with more suspicion than an individual and has never placed it on the same footing save where the combination has sought the sheep's clothing of corporate personality. But it is impossible to reconcile the decisions or the opinions of the highest English judges on the responsibility of combinations in the field of tort. An acute analyst of the leading cases in this field suggests that the only solution to the confusion that exists is the theory that interference with the trade or calling of another is actionable unless justified.[48]

[47] Allen v. Flood (1898), A.C. 1.

[48] A. C. Haslam, *The law relating to Trade Combinations*, chap. II. This theory Dr. Haslam shows to be in harmony with American law, quoting Justice O. W. Holmes on this point, p. 54.

And, indeed, the right to combine in defence of or in support of trade interests is recognized just as is the right of a man to contract with whomsoever he pleases.[49] This right was established beyond all doubt in the judgment of Lord Justice Bowen in the Mogul case,[50] and confirmed by the House of Lords.[51] In this case, certain shipowners formed an association to secure to themselves a certain freight route at profitable rates. They agreed that the number of ships sent to ports, the division of cargoes and also the freights, should be the subject of regulation and that a rebate should be allowed to all shippers who shipped only with members, while the agents of members who acted for shipowners outside the association should be liable to dismissal. The plaintiffs in the subsequent action were shipowners outside the association who suffered by being forced by the association to carry on at an unremunerative rate, and they alleged a conspiracy to injure on the part of the association. Said Lord Justice Bowen: 'The acts of the defendants which are complained of here were intentional and were calculated, no doubt, to do the plaintiffs damage in their trade. But in order to see whether they were wrongful we have still to discuss the question whether they were done without any just cause or excuse. The defendants have done nothing more against the plaintiffs than pursue to the bitter end a war of competition waged in the interest of their own trade. This commercial motive is not a personally malicious one.'[52]

He went on to say: 'I find it impossible myself to acquiesce in the view that the English law places any such restrictions on the combination of capital as would be involved in the recognition of a distinction between acts done jointly by a combination of capitalists and similar acts done by a single man of capital. For if so, one rich capitalist may innocently carry competition to a length which would become unlawful in the case of a syndicate with a joint capital no larger than his own, and one individual merchant may lawfully do that which a firm or partnership may not. What limits, on such a theory, would be imposed by law on the competitive action of a joint stock company limited is a problem which might well puzzle a casuist.'[53] 'If peaceable and honest combinations of capital for purposes of trade competition are to be struck at, it must, I think, be by legislation, for I do not see that they are under the ban of the common law.'[54]

Later cases have confirmed this rule;[55] that so long as a combination of capital is acting merely to advance or protect its own trade

[49] Committee on Restraint of Trade, *Report*, p. 6.
[50] Mogul Steamship Co. v. McGregor, Gow & Co. (1889), L.R. 23, Q.B.D.
[51] (1892), A.C. 25.
[52] L.R. 23 Q.B.D., 598, 615.
[53] L.R. 23 Q.B.D., 598, 617.
[54] Ibid., p. 619.

interests, making no threats other than warnings that a lawful course of action will be followed, no action lies. But, on the other side of the dividing line, a combination can commit a tort of which the essence is either conspiracy, intimidation or malice — the cases do not supply an answer.[56] Where exactly this dividing line runs appears, if one may judge from the cases, to depend on the ascertained motives of the combination; whether, that is to say, injury to a specific party rather than advancement of the trade interests of the members of the combination is the dominant motive. And motive is a question of fact, not of law.

The most recent illustration of the difficulty of deciding this question of motive came from the Hebrides, when the long arm of trade combination stretched across the seas to Ultima Thule. This was the case of the Crofter Handwoven Harris Tweed Co. Ltd. v. Veitch.[57] The Harris tweed produced in the island of Lewis was once made from handspun yarn produced in the island from the local wool. But in recent years hand spinning has died out and many of the weavers have imported yarn from the mainland, though some few mills continued to weave from the local yarn spun by the crofters of Lewis. The workers in these mills were very largely members of the Transport and General Workers' Union and the workers who loaded and unloaded the ships coming to the island were also members of that Union. The Union decided to press for higher wages in the mills and were met with the reply that the competition of the crofters who wove yarn imported from the mainland was such as to make higher wages in the mills weaving the local yarn impossible. The union officials then set out to destroy that competition by ordering their members on the Lewis docks not to handle any imported yarn. The success of this order was such as to ruin the businesses of the crofters weaving imported yarn, who thereupon began an action against the union officials for the tort of conspiracy.

The House of Lords held that, since the motive and purpose of the union officials was primarily to benefit the members of their union and only secondarily to injure the plaintiffs, they were not liable. If the purposes of the combination are mixed ones, the question is 'What is the predominant purpose?'[58] And if the members of the combination can say that they are damaging their competitor from the best of motives, self-interest, this is the predominant purpose

[56] Hodges v. Webb (1920), 2 ch. 70. Ware and de Freville v. Motor Trade Association (1921), 3 K.B. 40, particularly Atkin, L.J.'s judgment, pp. 79-91. Sorrell v. Smith (1925), A.C. 700.

[57] (1942) A.C. 435.

[58] See Sorrell v. Smith. (1942) A.C. 435; Viscount Simon. L.C. at p. 445; Lord Wright at p. 478.

freeing the combination from the taint of conspiracy. Thus the open purpose of establishing a monopoly can be in law a good defence against an action for conspiracy; for in law that purpose is the predominant purpose of self-defence. The great combine may be brought low by the small manufacturer and therefore has the right to protect itself by legitimate means against his ruthless competition.

4. *Contract and Public Interest.* Last of the general principles of law influencing the growth of economic associations is the rule of the common law that contracts in restraint of trade are unenforceable at law. The ability of men to form combinations by contract is not diminished by this doctrine, for there is a distinction between a contract which is unenforceable and one which is void through illegality. A contract in restraint of trade is a legal contract in the sense that it is not forbidden by the law, but it is not a legal contract in the sense that it gives rights of action to the contracting parties in the event of breach of its terms by one or other of them.

The position of such contracts at the end of the eighteenth century, both in England and America, lay between two conceptions of the limits of contractual ability. The basis of the restraint rule had been laid down long before under the Stuarts. It was a personal rule, a declaration that public policy demands from every man the free exercise of his trade in the public interest. No man, said the common lawyers, is free to deprive the public of the benefit of his skill, labour and industry to the detriment of the public, nor can he be deprived of the right to exercise his trade to his own advantage.[19] This is the common law's recognition of the principle of the division of labour enunciated by Adam Smith many years later, and of the economic interdependence of society. The common law basis of commerce, industry and most of the ordinary business of life is that these things shall be conducted by free contracts, freely entered into, between competing offers on one side and competing acceptances on the other. The principle lies behind the economic theory developed by Mill, Jevons and Marshall of the interactions of supply, demand and price, just as it lay behind the jurisprudence of Bentham and Austin.

It leads, however, directly to a dilemma. If the individual thus has a freedom of contract which the law will preserve in the public interest, does not this very freedom to contract as he pleases extend to contracting out of his liberty to trade with whom he pleases? Can freedom of contract be alienated by contract? In other words, is the

[19] Colegate v. Bacheler, Cro. Eliz. 872 (1596).

freedom of contract implicit in the doctrine of restraint subordinate or superior to the liberty of the individual? If freedom of contract overrides all other considerations the accent of the law must fall on the contract rather than on the freedom, and the right of men to limit their contractual liberty (if they so desire) denied. Freedom of contract in this view stops short of depriving oneself of liberty of contract. On the other hand, if the paramount consideration is freedom rather than contract, there is no reason why the law should not allow a man to contract out of his personal liberty to choose his customers if he deems the consideration he receives for so doing adequate. He is, after all, only exercising in advance his right to refuse dealings with a prescribed class of persons.[60]

Reduced to these terms the dilemma is plain; in the common law, however, it did not reach that stage of logic until facts arising from economic association came before the courts in the second half of the nineteenth century. The life of the common law is not logic but experience[61] and it was only the difficulty of relating the experience of individuals to the new facts of associations and combinations that brought the limits of contractual power backed by legal sanctions into question. It is to be observed that a contract in restraint of trade was never criminal in itself, though if it infringed the Statute of Monopolies or the common law definitions of regrating, engrossing and forestalling it might be criminal and was then void from the beginning. But if a man agreed upon terms not to exercise his trade in competition with another man, or to deal solely with another man, or to follow some similar line of conduct, he was at liberty to do so. In such circumstances, however, the courts would not provide either party to the agreement with a remedy in the event of a breach of the terms. Thus the law poised the two views of the limits of contractual power, balancing the interest of the public against private contractual liberty by putting unenforceability against recognizably legal contracts.

Towards the end of the eighteenth century the law may be said to have rested on two views. First, that the public interest in general was cared for by the criminal law. Thus a contract of trade combination by which prices were raised, or the supply of goods deliberately curtailed, was a public wrong, if not against a statute then at common law. Second, a contract not offending either a statute nor coming within the grasp of engrossing, regrating or forestalling might still be in restraint of trade. In this case, since it did not offend

[60] See Dicey, *Law and Opinion in England*, pp. 152-8. See also F. H. Knight, *Risk, Uncertainty and Profit*, p. 351.
[61] O. W. Holmes, Jr., *The Common Law*, p. 1.

public policy as defined in the criminal law, it was not illegal, but the courts would not enforce it unless it could be shown to be for the public interest that it should be enforceable at law. Though, therefore, the law was engaged in selecting the kinds of contracts to be enforced, it must not be overlooked that the sorting process was limited (as it is still limited) to cases of legal dispute over the content of breach of the alleged contract.

Behind the litigation recorded in the Law Reports have been many agreements in restraint of trade of which the legality was never questioned because the parties remained in accord and practised the terms. It is not true to say that the law of England has insisted on competition; it has insisted only on the right of a man trained in a trade not to be restrained from that trade as a means of livelihood without very good material reasons of benefit to himself.

What form do those reasons take in practice? They have arisen wholly out of the developing legal conception of property in intangibles. At some time in the sixteenth century it was recognized that the business built up by a tradesman was, as a going concern, of saleable value. Cases began to come before the courts after 1560 involving such transactions; the presumption is that the idea of a value attaching to the established expectancies of a business must have arisen at least fifty years before.[42] But implicit in the acceptance of the idea of a value in the business is the principle that the value must be preserved from competition by those concerned in it. That is to say, that the sale of the business involves its complete and permanent alienation, and servants involved in it by contracts of employment must not use their position to reduce its value. Neither of these things were admitted in the sixteenth century; they were too near the Statute of Monopolies. Only with the seventeenth century did the common law separate two lines of public policy — to keep a jealous eye on monopoly, but also a tender eye upon property. So there appeared in the law a series of decisions which protected the public from monopoly by forbidding a general restraint of trade, but which also protected the public interest that a man should not derogate from what he has freely alienated, by allowing partial restraints upon good consideration.[43]

A great leading case occurred at the beginning of the eighteenth century when Mitchell v. Reynolds[44] laid down a view which ruled the courts of common law for more than a hundred years. In this

[42] e.g. Colgate v. Bachelor (1596). Cro. Eliz. 872.

[43] Rogers v. Parrey (1614), 2 Bulstr. 136. Broad v. Jollyfe (1620), Cro. Jac. 596. Jelliet v. Broad (1621), Noy. 98. Bragg v. Stanner (1622), Palmer 172. Barrow v. Wood (1643), March N.R. 191. Prugnell v. Gosse (1649), Aleyn 67. Hunlocke v. Blacklow (1670), 2 Wm. Saunders 156.

case a baker assigned the lease of his bakehouse to the plaintiff, covenanting that he would not carry on the business of a baker in the same parish as the bakehouse for five years. The restraint was held to be valid by Parker, C. J., who pointed out that a valid involuntary restraint might be imposed by Crown grant, custom, or byelaws, for the regulation of trade, though a grant creating a monopoly would be void. Of voluntary restraints those only were invalid which caused loss to the restrained party by utterly depriving him of a livelihood, or which caused loss to the public by depriving it altogether of a source of supply. Partial restraints for the protection of a business from the competition of a seller or an ex-servant were good 'if made upon good and adequate consideration, so as to make a proper contract'.

Thus the question for the law moved from the mere protection of intangible property. It now turned to the consideration of the limits beyond which protection of property turns into monopolizing. If the common law was to retain its touch with actuality these limits must clearly be a question of fact for the circumstances of each particular case. To protect a business which A has sold to B from the competition of A, A must be kept out of B's entire ecomomic market. If B's business and A's new business are both capable of unlimited expansion, in the long run they are bound to compete, so that completely to safeguard B from A in time and space necessitates a complete restraint upon A from the particular trade concerned. The same thing applies to an ex-employee who sets up his own business. But the practical common law dealt with practical questions and these seldom involved either the fact or the assumption of markets on such a scale. A surgeon's practice could be adequately protected by limits of ten miles in space and fourteen years in time;[44] a solicitor's practice required a radius of 150 miles;[45] an apothecary one of twenty miles only.[46]

In this period the law was moving towards a test which would balance competition to protect the public right against the preservation of property to protect private rights. The test was found in Horner v. Graves.[47] 'The question is,' said Tindal, C.J., 'whether this is a reasonable restraint of trade. And we do not see how a better test can be applied than by considering whether the restraint is such as to afford a fair protection to the interests of the party in whose favour it is given and not so large as to interfere with the

[44] Mitchell v. Reynolds (1711), 1 Sm. L.C. 462.
[45] Davis v. Mason (1793), 5 T.R. 119.
[46] Bunn v. Guy (1803), 4 East. 190.
[47] Hayward v. Young (1818), 2 Chit. Rep. 407.
[48] (1831) 7 Bing. 735, 743.

interests of the public. Whatever restraint is larger than the necessary protection of the party can be of no benefit to either, it can only be oppressive; and if oppressive, it is, in the eye of the law, unreasonable.' It was held, a few years later, that a general restriction, unlimited in space and limited only in time, was invalid because the public would be altogether the losers for the time being of the services of the individual concerned.[69] But this view presupposes that the individual restrained can set up a new business somewhere beyond the immediate competitive range of the old; if this assumption is valid, which gives way, protection of the public or protection of the property alienated? The courts have at this point to decide which is the primary public interest henceforth to be dominant, protection of property or protection of the freedom of a man to exercise his trade.

The answer came fairly quickly from the Courts of Equity. On the basis of the decision in Horner v. Graves — that restraint must only be reasonable on the facts of the case — an injunction was granted upholding a general restraint limited only in time.[70] The rule was steadily followed in later cases,[71] and the common law courts necessarily followed the equity rule thus established, after the House of Lords had confirmed it.[72] The modern position of contracts in restraint of trade which are directed to prevent competition by way of protecting the goodwill of a business is substantially the same. Whether the contract is one of sale or employment a restraint may be imposed upon one of the contracting parties, which, so long as it is reasonable, will be enforceable at law. There is no limit to the degree of restraint that is enforceable; the old rule, that partial restraints are *prima facie* good and general restraints are bad, has disappeared.[73] A restraint may be general, but, whether it is partial or general, it must be justified.[74] And the question of whether the special circumstances adduced do or do not justify it is a question of law for the court.[75] In drawing a contract in restraint of trade the covenantee is entitled to protect what belongs to him, but not to acquire rights over and above that protection. The buyer of a business is entitled to safeguard the business from the competition of the seller, but only so far as is necessary to ensure that the seller

[69] Ward v. Byrne (1839), 5 M. and W. 548. Hindle v. Gray (1840), 1 Man. and G. 195.
[70] Whittaker v. Howe (1841), 3 Beav. 383. A solicitor had covenanted not to practise in Great Britain for twenty years.
[71] Leather Cloth Co. v. Lorsont (1869), L.R. 9 Eq. 345. Rousillon v. Rousillon (1880), 14 ch. D. 351. Badische Anilin und Soda Fabrik v. Schott (1892), 3 ch. D. 369.
[72] Maxim-Nordenfelt Gun Co. v. Nordenfelt (1894), A.C. 535.
[73] Nordenfelt case, p. 565.
[74] Mason v. Provident Clothing Co. (1913), A.C. 724.
[75] Morris v. Saxelby (1916), 1 A.C. 688.

does not damage what has been sold. No business can permanently restrain competition, nor is it entitled to; after a reasonable time it must be prepared to meet even the competition of its former owner, and how long that reasonable time should be is a question for the court. Again, no business can protect itself from the competition of its former employees. But a business can protect itself against the use, in competition against it, by a former employee, of the confidential information which forms part of its goodwill. 'The reason and the only reason for upholding such a restraint on the part of an employee is that the employer has some proprietary right, whether in the nature of a trade connection or in the nature of trade secrets, for the protection of which such a restraint is, having regard to the duties of the employee, reasonably necessary.'[16] It was thus with a developed principle of protecting the intangible property peculiar to each business that the common law looked at combinations of capital to restrain trade.

A combination of independent firms by contract comes about for one reason and only one — to protect the interests of the contracting parties, whether they are members of the same trade or of different trades. There are two types of association of this kind. There is the trade association, which is simply a representative body of the trade collecting information, collating statistics and performing services for the members.[17] Such an association may form the means of concerting practices in restraint of trade but it is not itself a restraining influence; each member remains free to direct his own business in his own way. But trade associations have gone beyond the simple functions of a bureau; in some cases the members have imposed on themselves, as part of their contract of membership, an agreement to limit supplies of goods to persons or firms tacitly approved by the association and not to supply 'blacklisted' firms.[18] This and the cartel organization proper, with mechanism for regulating output and prices, form the second class of combination. Damage resulting to third parties from these activities is a matter for the law of tort; the enforcement of the terms of the contract of membership and damages for breach are a matter for the law of contract.

These forms of economic association exerting a restraining influence on trade can all be included under the generic term 'cartel'. They are of many kinds, according to the functions they assume. For this reason no simple juristic notion of a cartel is possible; it remains an economic term, adopted as a convenient

[16] Lord Parker, in Morris v. Saxelby, at p. 710.
[17] e.g. A Chamber of Commerce.
[18] See Committee on Restraint of Trade, *Report*, pp. 20-2.

name for a particular method of economic control, which may take the most varied legal forms. The cartel in its most generalized form is an association of independent business units submitting to a degree of common rule through the mechanism of that association. The common rule is never great enough to deprive the member units of their separate legal entities as business units and is seldom great enough to exert a high measure of direction over the actual business of production save to regulate quantities; costs and profits remain the private matters of the member firms. Legally the association created is not visible to the law as separate entity; it has no personality, being merely a matter of contract between the members as individual producing or trading units. The objective of such an association is to protect each business from the severities of competition.

The courts sought a method of scrutinizing the contracts of such cartels in the assembled precedents on restraint of trade. And the precedents gave an answer drawn from the cases in which the purchaser of a business was protected from the competition of the seller or in which a business was protected from the competition of an ex-servant. Thus the question became one of degree; reasonable protection is allowable; unreasonable protection invalidates the contract.

Lord Haldane summed up the legal position by saying that 'when the controversy is as to the validity of an agreement, say for service by which someone who has little opportunity of choice has precluded himself from earning his living by the exercise of his calling after the period of service is over, the law looks jealously at the bargain; but when the question is one of validity of a commercial agreement for regulating their trade relations, entered into by two firms or companies, the law adopts a somewhat different attitude — it still looks carefully to the interests of the public, but it regards the parties as the best judges of what is reasonable as between themselves'.[19] To which another Law Lord in another case added that 'there is at present ground for assuming that a contract in restraint of trade, though reasonable in the interests of the parties is unreasonable in the interests of the public if it is calculated to produce a pernicious monopoly, that is to say a monopoly calculated to enhance prices to an unreasonable extent'. He goes on, 'it is clear that the onus of showing that any contract is calculated to produce a monopoly or enhance prices to an unreasonable extent will be on the party alleging it, and that if once the court is satisfied that the restraint is reasonable as between the parties the onus will be no light one'.[20]

[19] North Western Salt Company Ltd. v. Electrolytic Alkali Coy. Ltd. (1914), A.C. 461, p. 471.

[20] Lord Parker, in Attorney-General of Australia v. Adelaide Steamship Company (1913), A.C. 781, at p. 796.

The test applied with some practical success in the goodwill and employment cases — the reasonableness of the protection given by the covenant — breaks down here. In these two dicta two variables must be reasonable; the terms as between the parties, of which the fact of agreement is sufficient evidence; and the effect on the public through prices, of which evidence is hardly possible without full disclosure of costs and profits. The two variables are, in fact, opposed, and the reasons pull in opposite directions. For the aim of all combinations of this type is to safeguard the capital of the enterprises by safeguarding the level of profits, and the protection of the property invested in the combined units of production or trading may clearly be set down as in the public interest. This is the economic substance of Lord Haldane's point, and it may not be foreign to that particular public interest to regulate supply and keep up prices if such a procedure is necessary to prevent loss of capital and loss of employment. In short, costs and profits alone would be an unsafe guide to the 'public interest'. If the argument were pushed to its limit it might even be pleaded that it is unlawful at common law to carry competition to such lengths that it deprives workmen of the right to exercise the trade in which they have served an apprenticeship. But there comes a stage when protection of capital shades into monopoly, at which point the common law steps in with its second test of reasonableness. So says Lord Parker, adding that this is a secondary public interest which will be difficult to establish ('the onus is no light one'), if the primary property interest has been proved.

A few cases elucidate this conflict of reasonableness. Of contracts passing the double test, it was held as long ago as the Battle of Waterloo that coach proprietors might agree not to run in opposition and to observe the same prices.[81] 'This' (said Ellenborough, C.J.) 'is merely a convenient way of arranging two concerns which might otherwise ruin each other.' A few years later an agreement between box manufacturers to divide the country into exclusive territories for each party was found enforceable.[82] In two railway cases the principle of a traffic pool was approved, the prospective ruin of competing railways being suggested as very much against the public interest.[83] Again an agreement between quarry owners to leave one of their number to secure a contract at what profit he could, the others to supply him with stone at an agreed price, could be enforced by an injunction.[84] And a similar type of sharing out business

[81] Hearn v. Griffin (1815), 2 Chitty, 407.
[82] Wickens v. Evans (1890), 3 Y. and J. 318.
[83] Shrewsbury and Birmingham Railway Co. v. L. and N.W.R. (1851), 21 L.J.Q.B. 89. Hare v. L.N.W.R. (1861), 2 J. and H. 80.
[84] Jones v. North (1875), L.R. 19 Eq. 426.

between stevedores was held not to be beyond the legitimate interests of the parties.[86]

An important case came to the Judicial Committee of the Privy Council in 1909 on appeal from Canada, where the contract concerned had been held unenforceable.[86] The United Shoe Machinery Company of Canada leased out machinery under an agreement by which the lessees covenanted not to use machinery not leased from the company. The Judicial Committee held the contract enforceable. The basis of the judgment was the principle that business men are free to conduct their trade in the manner they deem best in their own interest, so long as they do nothing illegal. The machinery company was therefore as free to stipulate for certain covenants as the other party to such negotiations was to refuse to deal with the company. This, however, is carrying the protection of capital and profits rather far. It cannot be said that a covenant for the destruction of competitors' markets forms a reasonable protection against competition. An agreement between competitors to maintain their mutual business stability can be distinguished from an agreement between buyers and sellers to exclude lawful competition without any of the economic theorizing that the Law Lords regard with such suspicion.

The one limits competition, certainly, but it does not necessarily establish a monopoly and destroy competing businesses. The other aims at a monopoly and at a monopoly alone, for it deliberately crushes competition. Their Lordships expressed the view that 'if the monopoly established by the appellants and their mode of carrying on their business be as oppressive as is alleged (upon which their Lordships express no opinion), then the evil, if it exists, may be capable of cure by legislation or by competition, but in their view not by litigation. It is not for them to suggest what form the legislation should take or by what methods the necessary competition should be established'.[87] Had the principle of reasonableness been applied to determine whether the contract merely afforded a necessary degree of protection to capital, such a conclusion could not have been reached. The covenant is not directed to the protection, but to the destruction, of capital; it aims at the elimination of competing firms. Nor is the covenant one of association between capitalists at arm's length. It is a covenant between a seller exploiting power he possesses by way of patents to limit the buyer's field of future choice, so that the buyer can no longer trade as he pleases and so that

[86] Collins v. Locke (1879), 4 A.C. 674.
[86] United Shoe Machinery Co. of Canada v. Brunet (1909), A.C. 330.
[87] Ibid.

the seller's competitors are deprived even of access to the market.

There can be no doubt that this is restraint of trade at common law, and it may also be noted that the use of patents to the 'hurt of trade' is contrary to the old Statute of Monopolies. A little consideration of the economic functions of the parties to this and other contracts in restraint would have provided the Judicial Committee with an appropriate defence of the public interest as far as the leasing of shoemaking machinery is concerned. When the United Shoe Machinery Company's system of contract came before the United States Supreme Court a judgment condemning it under the Clayton Act ended with the court's opinion that 'it is hard to see how the ingenuity of man could have devised a scheme that would more effectually create a monopoly than the scheme set forth in the bill in this case'.[88]

The Committee was preoccupied with the primary reasonableness as between the parties and did not deem it a duty to assess the secondary reasonableness as between the parties and the public. They did not perceive that there is not one type of economic nexus, but two. There is the conflict of interest of sellers or buyers between themselves, but there is also the conflict of interest of sellers with buyers as to the price that shall be paid. Allow a monopoly of either buyers or sellers in any field and the price is no longer a matter of competition and supply and demand, but of reason or of 'what the traffic will bear'. This second public interest in competition was shut out of court in the North-Western Salt case.[89] There was here an agreement between certain salt manufacturers to regulate output, fix prices, and sell through a central selling agency. The plaintiff company, a member of the association, alleged sales in violation of the agreement and sued for damages. The defence did not plead that the contract was in restraint of trade and therefore unenforceable, and the case turned on the construction of its terms. Scrutton, J., found for the plaintiffs, but the Court of Appeal held the contract unenforceable. Farwell, L.J., raised the point that the proper nexus between buyers (the public) and sellers (the salt manufacturers) was destroyed, that is, that the contract was against the secondary public interest.[90] The House of Lords reversed this decision and upheld Mr. Justice Scrutton, but it was established that when a contract is in unreasonable restraint of trade on the face of it, the courts will

[88] U.S. v. United Shoe Machinery Coy., 227 Fed., 507 (1915).

[89] North-Western Salt Coy. Ltd. v. Electrolytic Alkali Coy. Ltd. (1914), A.C. 461.

[90] Haldane, L.C., ibid., p. 465: 'No circumstances could justify such a contract made for the purpose of raising prices, with the inseparable incident of depriving the members of the public of the choice of manufacturers, while hoodwinking them into the belief that such choice is open to them; in any case the special circumstances would have to be pleaded and proved by the Plaintiffs.'

not enforce it, whether restraint is pleaded or not.[91] This concession to Lord Justice Farwell's view was rendered useless as a protection of the public interest because, as Lord Haldane admitted, unlawful restraint can rarely appear on the face of such an agreement and depends on the surrounding circumstances, in which case it must be raised on the pleadings to receive judicial attention. Unless, therefore, one of the parties confesses to monopolistic practice the secondary public interest on the price issue cannot come into court, while for the primary interest of protecting profit and property 'the parties are the best judges of what is reasonable between themselves'.[92] Later cases confirm this ruling.[93]

A second line of cases, in most of which contracts were held unenforceable, establish another rule important in its bearing on the secondary public interest of reasonable prices and perceptible competition for the favour of the market. In Hilton v. Eckersley the court was concerned with a combination of masters directed against workmen and it was ruled that a contract to carry on one's trade in conformity with the will of others is contrary to public policy.[94] But the contract is valid if the parties care to observe it, a point clearly established some ten years after Hilton v. Eckersley,[95] and confirmed in the Mogul case. In another case it was said from the bench that 'the general rule still remains. A combination for the mere purpose of securing higher prices not based on any legal consideration is not to be enforced by law. Such a combination is not illegal in the sense that it is punishable, but it is illegal in the sense that it is not enforceable by the courts'.[96] Restraint by contract is thus permissible in English law to any degree if the parties are not in dispute. If a dispute arises and is followed by litigation the test of enforceability is the view of the contract taken by the parties at its conclusion.

5. *Conclusion.* To return to the question posed at the beginning of this article: How far does the law of England allow monopolistic practices? The answer may be put thus: That in so far as the intention of such practices is the defence of trade interests or the protection of invested capital or commercial goodwill, the practices are allowed. No kind of economic monopoly is forbidden; any kind of economic monopoly may be approved by an English court so long as the circumstances of the case are held to justify it. Moreover, those circumstances taken into consideration by the courts are within a clearly

[91] Ibid. [92] Ibid.

[93] Rawlings v. General Trading Coy. Ltd. (1921), 1 K.B. 635. English Hop Growers v. Dering (1928), 2 K.B. 174. Palmolive Coy. (of Great Britain) Ltd. v. Freedman (1928), Ch. 264.

[94] Hilton v. Eckersley (1855), 6 E. and B. 47.

[95] Hornby v. Close (1867), L.R. 2 Q.B. 153.

[96] Day, J., in Urmston v. Whitelegg, 1890, 7 T.L.R. 41, 295.

defined circle. They do not include any evidence of any general effect of the practice under discussion, but only its particular effect on the party complaining of it. And the 'public' is never a party to a legal action, and can never complain in a court of law of higher prices or lack of competition. Much more important in the law than effects are the intent and purpose of the practice under scrutiny.

It is no fault of the judges that this is so. The judge has to decide whether, in his opinion, the conduct of one or other of the two parties before him conforms to the principles of English law he understands. There has never been, in the common law of England and the United States, any principle which discouraged that increase in economic power which comes from the resource and ingenuity of the individual. In the early seventeenth century the general attack on the Royal grant of monopolies by Letters Patent was not directed against the investor and the inventor, but against the augmentation of the royal revenue by this means. In any branch of industry and trade, commercial success brings with it some degree of economic control of the market, recognized as having a value. And the law has allowed that those concerned with the direction of businesses might exercise their ingenuity to protect that value, by agreements in restraint of trade, or by action, concerted with others, to defend it from competition, including the competition of lower costs and prices.

Competition implies that there must be losers as well as gainers by it. If competition is limited it means that the burden of loss is passed on to the public at large. And while monopoly carries some connotation of vice, the protection of trade equally connotes virtue. The balance of the two is an operation which the English courts have steadfastly refused to attempt. The courts have, in fact, reasoned within the confines of legal ideas of unimpeachable ancestry. That parties to an agreement, freely entered, are the best judges of what is reasonable; that a rightful act cannot be held to cause actionable damage — these principles are beyond doubt. And if their interpretation in case law has led to a general proposition that reasonable or defensive monopoly is the legitimate result of competition, that is rather the result of economic development than of any real failure on the part of the courts to defend the defensible. For if all economic factors are taken into account, it is not possible to make that assessment of any monopoly which would make it clear beyond all reasonable doubt that it is pernicious. What is possible is to isolate certain practices which are employed to defend a monopoly and to declare them to be unfair. This is the difficult and, in some ways, invidious, task that falls on the Monopolies Commission. The

answer to my opening question is that the law of England in no way discourages monopolistic practices; that it will, indeed, uphold them; and that the present issue is whether a test can be devised which will establish beyond doubt when the privilege of monopoly, granted by the law, has been abused.

MAGDALEN COLLEGE, OXFORD

THE SALE OF THE SYNTHETIC RUBBER PLANTS

by Robert Solo

Introduction. Since 1942 a basic industry created during the war as an instrument of strategic self-sufficiency which represents an initial investment of some seven hundred million dollars, and sells about half a billion dollars worth of synthetic rubber a year, has been owned and (nominally) run by the American Government. On August 7th, 1953, Public Law 205 was passed sanctioning a plan for the sale of the Government plants to private ownership.

This paper will (a) briefly describe the organization and technical structure of the industry, (b) recall the record of its operations under Government control, (c) suggest reasons for the long phase of Government operations and the decision to transfer ownership at this time, and (d) will consider some of the problems and implications of disposal in the light of conflicting theories of industrial organization.

Structure and Organization of the Industry. In the original Government program three types of synthetic rubber were produced: neoprene, an oil resistant specialty rubber produced in moderate quantities before the war by du Pont de Nemours & Company on the basis of patents owned by that company; butyl, a Standard Oil Company (N.J.) development which is characterized by a high degree of gas impermiability and is used to fabricate inner tubes; and GR-S, the German buna-s rubber, which constitutes the great bulk of the industry's output and which is used to fabricate tire treads and tire carcasses. All rubbers are composed of the linked chains or clotted masses of large hydro-carbon molecules. Butyl is composed of the molecules of isobutylene and small quantities of isophrene linked together, i.e. copolymerized. GR-S is produced through the copolymerization of butadiene and styrene (in a bulk ratio of about three to one). Butadiene, the principle raw material in the production of GR-S, is derived through the further processing of the petroleum gases butane and butylene, or is produced uneconomically from alcohol. Butane and butylene and isobutylene, all regular refinery products, are used in the synthesis of organic chemicals and provide the high-octane component of gasoline. There is, however, no bulk demand for butadiene other than in the production of synthetic rubber. Styrene, which is produced from benzine and ethylene and involves chemical rather than refinery processes, is widely used in the production of plastics.

Certain of the Government plants were sold between 1946 and

1949. These included the neoprene plant sold to du Pont, and four of the five styrene plants which went to large chemical companies. The Government now holds two butyl plants, eight petroleum-to-butadiene plants, two alcohol-to-butadiene plants, one styrene plant, and thirteen plants copolymerizing styrene and butadiene into GR-S. A branch of the Reconstruction Finance Corporation (Rubber Reserve) has been the agency in charge of the industry, but the plants have been operated by private companies on U.S. Government account, at costs plus a fixed fee. While it has been alleged that there is 'as a matter of pride' some competitive pressure for companies to keep their operating costs in line with the costs of others, the only positive incentive to operating efficiency which can be discerned is the expectation by particular companies of eventually buying from the Government the plant they operate, and hence the desire to develop efficient methods and effective organization. Ostensibly, synthetic rubber has been sold at cost, including a substantial amortization allowance. In fact, however, prices have been conventionalized and rigid. Initial prices were determined by an arrangement with the wartime Office of Price Administration on basis of a supposed differential in the cost of processing synthetic as compared to natural rubber, and the wartime price schedule was continued unchanged until 1950, when a series of increases was required to cover reactivation costs and the use of alcohol as the marginal butadiene feedstock.

The two butyl plants were built and are operated by the Standard Oil Company (N.J.) and a subsidiary. Major petroleum firms built and run (in one instance through a jointly held operating company) the petroleum-to-butadiene plants, with the exception of one plant which has recently been operated by Copolymer Corporation, an association of smaller tire manufacturers. The alcohol-to-butadiene plants and the styrene plant were built and are run by large chemical concerns. The copolymerization plants were built by the large tire manufacturers. These tire manufacturers and other rubber product producers operate the GR-S units, with the exception of one plant which has recently been run by the Philips Petroleum Company.

Rather than that of a nationalized industry, the synthetic rubber operation has had the aspect of a producers' cooperative. The controlling agency has been preeminently staffed by former officials, usually on short or extended leaves of absence, from operating or otherwise associated companies. The controlling agency has been chiefly concerned with coordinating and providing services to the operating units. Firms operating the plants have either processed their own refinery products, as in the case of the petroleum com-

panies; or have been producing rubber, in part for their own consumption, in the case of the tire companies.

Research projects, constituting a substantial program, have been contracted out to various companies, research institutions and universities, but without highly significant results. The important technological advances that have been made have had their genesis in peripheral private research and in developments originating in Germany and Canada.

The Period of Government Operation. Secretary of State Dulles, before a Senate Committee on July 20th, 1953, testified that 'friendly nations find it hard to believe that the United States — the champion of free enterprise — competes with their natural rubber resources'. How is it that the United States 'champion of free enterprise' has maintained a Government monopoly of synthetic rubber for such a considerable period of time, and at this point, without hitch or opposition, makes ready a rapid transfer of the plants to private hands? The transference, at this time, is not to be accounted for by the Republican victory. The change of administration will certainly affect the terms and conditions of sale, but the transference itself was prepared for and recommended before the election, and would have taken place regardless of the party in power.

The continued operation of the synthetic rubber plants in Government hands, indeed their continued operation in anyone's hands, has been the result of a complex interplay of political pressures which, prior to 1950, made the disposition of the industry impossible, and after that time shifted so as to render the sale of the plants inevitable.

For security reasons, preconditions of transfer have been (a) that at least a 'nucleus' level of operations would continue to be carried on in the privately owned plants after the transfer, and (b) that an additional margin of plant capacity would continue to be available for the production of rubber and its components on short notice, i.e. be kept in production or capable of quick reactivation. This meant that there must be a minimum initial purchase by private parties at least up to the 'nucleus' level of plant capacity before the Government could step out completely and allow private ownership to take over; the alternative of a piecemeal disposition involving the competitive operation of Government and private plants being unacceptable to both industry and Government. It also required an undertaking by purchasers of all plant earmarked as a part of the full security program, that if such plant was taken out of production it would be held in readiness for a quick reactivation.

In the past there have been two major resistances, one passive and

the other active, to attempts to arrange for a sale of the plants. First, industry, by and large, did not *want* to make any substantial investment in synthetic rubber plants so long as the Government could be relied upon to sustain the operation and to supply the product. The plants were regarded as very useful, even necessary, in the short run, because they offered an alternative supply of rubber during the crucial period of post-war reconstruction and of 'temporary' natural rubber scarcity. But with ten-cent-a-pound natural rubber visioned as in the offing, the purchase of these plants appeared as a risky and unpromising long run investment. With the single exception of the Philips Petroleum Company, no firm appeared aggressively intent on buying butadiene and copolymerization plants and going into the synthetic rubber business.

Not only was private finance indifferent to the purchase of the plants, but there were specific companies who vigorously opposed their immediate sale. Especially was this true of a number of the smaller tire companies and of the largest single tire company. This opposition may be variously explained. It seems clear that the smaller companies were afraid that their large rivals would buy and would use possession of the rubber plants to reshape the structure of the tire industry, i.e. possibly squeezing the small non-integrated companies out of existence by restricting the sale of synthetic rubber or by demanding exorbitant prices for it during the periods of natural rubber shortage. The largest company, it has been suggested, was reluctant to see any changes in the competitive situation which might disturb the existing balance of industrial power. Finally, those not contemplating the purchase of Government plants may have been reluctant to surrender lucrative operating contracts, as they would have been obliged to do if the plants were sold.

Responsive to these active resistances, aware that nothing but a give-away market was in prospect, and faced with the fact that the synthetic rubber operation was not only covering all of its costs but (wonder of wonders) was amortizing the Government's investment, Congress was inclined to let well enough alone.

There was surely a general sentiment in favor of private ownership *per se* and no one challenged the desirability of transfering the plants 'eventually'. But at the time, sentiment was not of a force sufficient to overweigh the less abstract considerations.

The issue during this period was not only as to who should operate the industry, but also as to whether the industry should be kept in operation at all. At the war's end, a high policy board of military strategists and interested industrialists under Mr. William Batt (the Inter-Agency Policy Committee on Rubber) recommended as

necessary for national security that there be maintained in operation a 'nucleus' synthetic rubber industry producing annually at least one-third of total rubber requirements. But as time passed the old war-hands drifted away from the seats of power, and the strength of the resolve to stay militarily prepared tended to evaporate.

In the potpourri of commercial interests (which exerted a steadier pressure on policy) there were those for whom the new industry was an advantage, and others for whom its existence was a disadvantage. There were the competing operations of the natural rubber producers, the natural rubber importers and the scrap rubber industry for whom the new industry was a disadvantage, and who would oppose its continued operation. There were the complementary operations of the producers of petroleum and chemical feedstocks to whom the industry offered a small additional market, and for whom its operations were an advantage, though not a very great one. These producers would lend their support to a high, protected level of synthetic rubber consumption. Finally and most important, there were the powerful consumer interests, the tire manufacturers and the fabricators of other rubber products.

For these consumers the continued operation of the synthetic plants appeared advantageous only to the extent that synthetic was preferred to natural at existing price ratios. Only a very few understood that their interests as consumers in the continued operation of the synthetic rubber industry could not properly be evaluated in terms of existing and anticipated price ratios alone. In part this was because of the effects of the synthetic rubber operation on the total raw material bill. The natural rubber supply function in an uncontrolled market (the cartel regulation of supply was not a feasible alternative in the politically divided Far East of the post-war period) is notoriously inelastic. Hence the reduction in aggregate demand for natural rubber resulting from the shift to synthetic rubber consumption, whether that shift was voluntary or enforced, tended drastically to reduce the world price of natural rubber. It would therefore be likely that the combined cost of both rubbers would be less when manufacturers were obliged to consume a minor proportion of synthetic, even when existing price ratios were unfavorable to synthetic.

Moreover, the existence of the new rubber source stabilized raw material prices, a highly important factor in the tire industry where the need for huge investment in working inventories plus the extreme instability of the natural rubber market has long caused a wasteful diversion of entrepreneurial energies into speculative activity, and where continuing raw material price-unpredictability has handi-

capped managerial attempts to organize production efficiently. This greater price-stability is achieved, first, inasmuch as the stable-priced synthetic rubber is substituted, by reason of an enforced level of consumption, or by reason of a marked technical superiority of synthetic in certain uses over natural rubber, and consequently the absolute magnitude of the speculative sector is correspondingly narrowed. Second, inasmuch as synthetic and natural rubber are substitute materials and may be freely substituted, the demand function for natural is rendered considerably more elastic. Consumption shifts to synthetic when natural rubber prices are high and away from synthetic when natural rubber prices are low.

In any case, at the price ratios of synthetic and natural rubber which prevailed from 1945 until 1949, patriotism coincided with profitable operations and a protected Government industry was strongly supported by consuming interests. However, in 1949 natural rubber prices, from a five-year average of about 22 cents a pound, dropped well under the GR-S price of 18.5 cents a pound, to as low as 14 cents, and averaged 17.56 cents a pound for the year. The long prophesied downward trend of natural rubber prices seemed to have arrived. The interest in a strong national security policy for synthetic rubber waned. Production and consumption were reduced far below the level considered minimal in the Batt Committee report, but even then tire manufacturers were obliged to consume a somewhat greater quantity of synthetic rubber than they would have preferred to do at the new price ratios.

Up to this point protection of the synthetic industry through the mandatory use of this material had been merely nominal. Producers were required by administrative order to consume a specified proportion of synthetic rubber as a percentage of their total consumption in the production of various categories of rubber products. Demand, however, had exceeded by a considerable margin the imposed requirements, so that 'specifications' amounted to a standing order with the Rubber Reserve, guaranteeing that the wants of the particular producer would be supplied up to the level indicated. Now, for the first time, the commercial consumer tasted the bitter flavor of an obligation that seemed to run counter to his self-interest.

Individually and through their trade association, these powerful consumers of rubber turned on the Government synthetic rubber operation. In Congressional hearings they demanded that the operation be abandoned; that the plants be junked or 'put in mothballs'. An adequate stockpiling program, they contended, would provide security enough. The Rubber Reserve interposed no objection. Petroleum feedstock producers remained, as before, mildly in favor

of continued protection. Disconcerted Congressmen and Senators found it difficult to adjust themselves to the quick turnabout, and resisted the pressure for drastic action. Whether the 'nucleus' industry, whose continued maintenance post-war security-planners had considered so essential to American safety, could have survived another six months of a slightly unfavorable synthetic-to-natural rubber price ratio is a question which must remain unanswered, since by 1950 natural rubber prices had started a rise to heights that had not been approached in decades. For 1950, natural rubber prices averaged 41.10 cents a pound, and by February 1951 the price of natural rubber stood at 73.61 cents a pound. The clamor now was for reactivating closed-down plants, for building new plants and in any way possible increasing the output of synthetic rubber.

From 1950 onwards the private ownership of the synthetic rubber plants became increasingly attractive to potential investors. This cumulative brightening of long range commerical prospects took place for several reasons. The violent post-1949 price upswing punctured the sanguine and insubstantial expectations of a new era of low cost natural rubber. The conclusions of a major Government survey (Report of the President's Materials Policy Commission, 1952) supported by the research of trade statisticians, strongly indicated a vastly increased future need for synthetic rubber. Finally, technological advance significantly lowered the production costs, e.g. the oil-extension process, and greatly improved the quality of the product, e.g. through low-temperature polymerization (cold rubber) and use of high-abrasion carbon blacks. Quality improvements are such that a substantial market appears assured for the synthetic product in the fabrication of passenger tire treads, regardless of the natural-synthetic price ratio.

This new desire of private investors to buy the plants and their willingness to pay (if necessary) a reasonable price for them, added to the general sentiment in favour of disposal, was irresistible. Copolymer, an association of the more potent small tire companies, who had previously resisted transfer, was groomed for the take-over of an integrated butadiene and GR-S operation. Quick action was prevented by the reactivation and plant expansion which was taking place within the context of the Korean crisis and of the threat of major war, but the sale of the plants had become inevitable. The question was only *when* and *on what terms*.

The Problem of Sale. There have been at least three official plans for the disposal of the industry, prior to the one now being put into effect. The last of these three, recommended by President Truman to the

Congress in January 1950, and incorporated into the so-called Steelman Report, was based on a comprehensive inter-departmental study that reflected especially the point of view of the Department of Justice under the previous administration.

The disposal plan proposed by the Steelman Report had two (by no means commenserable) objectives. First was the desire to protect the interest of the Treasury and the taxpayer by realizing the highest possible price for the sale of the plants. To this end wide advertisement and clarification of the terms of sale were suggested, including the precise financial definition of the meaning of the 'reasonable royalties' phrase included in the agreements made with private companies for the wartime pooling of patents. These and other measures designed to widen the buyers market would not only tend to maximize the price at which the plants were sold but also would enable a greater dispersion of ownership, and hence would bear on the second and major objective of the plan.

The second objective was that of creating market conditions and a structural organization for the new industry which might be considered as the best obtainable. This aspect of the plan is especially significant in that it manifests and illustrates a relatively vigorous anti-trust policy in action, and offers an interesting contrast to the present disposal program.

Anti-trust policy relevant to this latter objective may be summed up in a two-fold rule of action. First, anti-trust agencies have sought to maximize the number of independent selling agencies. Conceiving of competition in the classical sense, larger numbers of sellers is equated with increased competition and the converse with smaller numbers. Second, these agencies have opposed the concentration of economic power in the hands of the very large 'dominant' enterprise, under the presumption that the dominant firm is inherently an enemy of competition which can, by its very prestige and the magnitude of its economic power, discipline the reluctant and lead its industry along the paths of monopoly.

Those who formulated the plan recognized the extreme difficulty, under the given circumstances, of stimulating extensive bidding and of dispersing ownership as widely as was technically feasible. Negotiations must perforce be limited to those few business entities who were both technically competent and financially powerful, since operations involved new and complex techniques and since large sums of money would be required to purchase and to operate physical units of this magnitude. It would require, for example, annual working capital of more than $2,500,000 to operate a single GR-S plant. Moreover, the large tire and petroleum companies who had built

and who had, for a decade, been operating these plants possessed special advantages in any bidding for them. These firms alone had the organizational know-how, the special technical competencies, the experienced operating staffs and research personnel trained in terms of the technology and science of synthetic rubber. Since these companies had been conducting private synthetic rubber research projects at least since 1948, it could be supposed that they had an accumulated backlog of unapplied and unexploited invention — which supposition is sufficient to frighten away an outsider from bidding. Moreover the companies operating GR-S plants controlled a major part of the market for GR-S, while the companies operating feedstock plants owned the refineries upon which these plants must depend for basic raw material. All butadiene plant and butyl plant is physically integrated into the private operations of petroleum refiners, and in some instances the facilities are reputedly so commingled as to be separable only at considerable expense.

Accepting these limitations, anti-trust objectives were pursued. In order to widen the potential market for plants and hence to enable a greater dispersion of ownership, the plan recommended financing schemes designed to shift to the Government a large share of the risks involved in the private operation of the plants, e.g. installment payments with an unlimited walk-away privilege, and 'functional payments' adjusted each year according to the percentage of capacity at which the plants were operated. Thus a greater initial price could be asked for the plants, and outsiders might be induced to risk buying into the new industry. It was further recommended that special conditions and terms of sale including a lower purchase price, more generous credit terms, lower down payments and lower rates of interest be extended to 'non-dominant firms and especially small business'. Under Justice Department pressure seven small companies were subsequently brought in to participate in the operation of the copolymerization plants, thus to acquire the know-how that might enable them to buy into the industry.

In order to maximize the number of independent enterprises, and to check the further growth of the very large companies and the further extension of their power into new markets, and to protect the sources of supply of non-dominant manufacturers of rubber products, it was recommended that a specific limit be set on the amount of plant capacity which any one firm could acquire, that the acquisition of a copolymer plant by non-dominants be made a precondition of the acquisition of such plant by dominant firms, and that 'three step' vertical integration be forbidden except by special Presidential determination. The interdiction regarding vertical integration would

have meant that petroleum companies acquiring butadiene plants would not be allowed to bid for copolymerization plants, and that tire manufacturers acquiring GR-S plant would not be allowed to bid for butadiene capacity.

Critics of anti-trust policy might object to the bias against size *per se*, and might argue that the concern to maximize numbers as a means of inducing effective competition was misplaced in the special circumstances of this industry, where oligopoly is inevitable, i.e. even assuming that each plant is purchased by a different company, there would be a maximum of two firms on the butyl market, eight firms on the butadiene market, and thirteen firms on the GR-S market, and therefore that one must look beyond the variation in numbers in the search for the means of assuring a sufficient protection of consumer interests.

It is, however, in its recommendation against vertical integration, that anti-trust policy here seems most vulnerable. This rule would have tended to perpetuate an economically and technically anomalous, separate butadiene market which was created by the arbitrary decision of the political bureaucracy during the war. In that market a few firms would face a highly inelastic demand (demand for butadiene would be insensible to price variations since its consumption is exclusively a function of the price and the demand for GR-S, which is in turn largely derived from the demand for tires) with the likely result of a high and rigid butadiene price policy. In this case, vertical integration or the effective threat of such would be the most powerful weapon available to protect the interests of the consumer.

It would appear to us to be the public interest that mixed forms, i.e. integrated companies producing petroleum, butadiene and GR-S or butadiene, GR-S and tires, and independent companies producing only GR-S and its feedstocks, should be encouraged initially, in the expectation that a salutary competitive pressure would be generated thereby, and that the most economic form of organization would have the greater chance of evolving through such competition.

Moreover, assuming the new industry to be a strategic asset whose survival is important to national security, each of these organizational forms would have a particular contribution to make to the industry's development and survival. The independent rubber producer would have the maximum incentive both to seek new and more economic raw material sources and to develop a wider range of end-product uses. Both the forward-integrated and the independent producer would have an unequivocal self-interest in demanding trade protection for the industry should the ratio of synthetic to natural rubber prices require it. And to the extent that the overhead costs

of the new industry are borne by backward-integrated manufacturers of tires and other rubber products, the greater will be the bias in favor of the consumption of synthetic *vis à vis* natural rubber, i.e. the level of consumption will be determined not by the relative market prices of the two materials but by the market price of natural as compared to the marginal costs of producing synthetic. However, it is by no means clear, considering the importance of natural rubber production to impoverished and politically vital areas of the world, that public policy should favor the consumption of synthetic as against natural rubber.

Present Prospects. Anti-trust policy has been virtually eliminated from the present disposition plan. Provisions designed to widen the potential market or to favor small business, and restrictions intended to limit the growth of dominants or their extension into new markets are absent. The Attorney General remains uneasily in the background to advise and to approve. The three man commission, charged with the task of disposition, will negotiate on the basis of highest bids received, although they have been given the right (on Senate insistence) to seek a higher price or to accept a lower price than the highest bid, thus leaving a way open at least for a gesture in favor of 'small business'.

In one important respect the bidding might be more spirited and consequently the prices at which the plants are sold be higher under the present plan than under that of the previous administration. Without the ban on vertical integration, tire companies and petroleum companies may bid on both butadiene and GR-S plants, and with no restriction on the number of plants that dominants can possess, the number of potential bidders on each plant would be likewise extended. It would nevertheless surely appear that the cards of this game are stacked in favor of the present operators of Government plants as potential purchasers. The commission is to be appointed from outside the petroleum and tire industries, but the ground work for the negotiations will be done (not by the three strangers to the industry, but) by what remains of the rapidly disintegrating operating organization which is due for an abrupt termination at the conclusion of this task. Thus the personnel charged with arranging for the sale of the Government plants will return to work, or will be obliged to seek work, with the very companies who are prime parties to the negotiations. It is unlikely under these circumstances that there will be any frantic effort to induce new buyers into the market, or otherwise to sharpen and stimulate bidding.

Regardless of the Government's plan (or lack of one) there is every

prospect that a strongly rooted, technologically progressive and sufficiently competitive synthetic rubber industry will develop in private hands. The petroleum and tire industries, poised to take over the butadiene and copolymerization plants respectively, are aggressively competitive and technologically progressive as compared to other industrial sectors, and it is to be expected that these qualities will be carried over into the synthetic rubber operation.

Moreover, these two strong industries, anchored at either end of the synthetic rubber operation, would seem bound to act as a balance against each other in the consumer interest. The tire manufacturer, whether as an operator of synthetic rubber plant or as a buyer of the finished butyl or GR-S or as a buyer of feedstocks, will always be concerned to lower the production costs and prices of synthetic rubber and its components. Unduly high prices and restrictive practices by the manufacturers of rubber products could induce petroleum producers possessing feedstock or owning rubber plants to integrate further forward into end-product manufacture and distribution in order to secure a wider outlet for their basic output.

Finally, the consumer interest will be protected by the fact that synthetic remains competitive with natural rubber at the margin.

It is even likely that there will be a considerable dispersion of ownership, as a result not of any Government intervention but of the desire within the industry to arrange things amicably between those who want to buy into the synthetic rubber operation and thus to avoid internecine strife and public outcry, at least until the bargain with the Government is concluded.

RUTGERS UNIVERSITY,
NEW JERSEY

A NOTE ON FORECASTING DEMAND FOR SPECIAL OFFERS IN A MAGAZINE

by MAX K. ADLER

1. *Introduction.* This note is specifically concerned with the problem of forecasting the demand for commodities which are the subject of 'special offers' by a particular journal. The main part of the note will discuss the technique of forecasting which has been evolved. There are, however, two aspects of wider significance. First, that the techniques which have been developed may be applicable in the forecasting of demand for other commodities offered for sale through other channels; attempts at such more general use may enable further improvements and modifications in the forecasting methods. Second, apart from this technical interest to statisticians forecasting demand, there is the point that the methods which have been developed seem to imply certain generalizations about consumers' behaviour in particular situations, and it may be of interest to economists to consider them.

2. *The Problem.* The journal *Woman* is a weekly magazine with a certified circulation of over 2,500,000 copies per week. It costs 4½d. and is read by over 6,000,000 women and girls aged sixteen and over in the British Isles. The publishers claim it to be the largest women's magazine in the world. One feature of the journal is that from time to time it arranges for its readers to acquire commodities which it offers on special terms. These offers cover broadly three types of commodities: cosmetics, household goods, and articles of clothing. The offers are always made in feature articles and not in advertisements. Readers who wish to purchase the offered article or articles are asked to send in a coupon together with a postal order for the amount asked for. On the coupon readers give their name and address and indicate their particular choice, if more than one variety is offered.

Whether or not the problem of maximizing profits arises, the publishers of *Woman* obviously do not wish to make losses on the offers. It is necessary to give firm orders to the manufacturers a considerable time before the offers appear in the journal. Many offers are taken up by readers in their hundreds of thousands; large quantities are, therefore, involved, and a wrong judgement on the size of the order to be placed with the manufacturers can involve sizeable losses. These can arise in two different ways:

(i) If the demand is overestimated, a certain number of the

articles offered are left in the hands of the publisher who has to dispose of them in the best possible way.

(ii) If the demand is underestimated, a large number of readers who have sent for the offer cannot be satisfied. Since the buyer sends the money when applying, the clerical work connected with returning the individual amounts is very heavy and, together with the postage, also very expensive, quite apart from the loss of goodwill.

Originally, decisions about the magnitude of orders depended on the business acumen of the persons handling the offers. The question arose how far it was possible to use market research and statistical methods to answer beforehand how many readers would be likely to send for any particular offer.

3. *Method of Forecasting Adopted.* For offers which had already been made, of course, the total sales were already known. It was thought that these statistics could be used to forecast the sales of a new offer, if it were possible to establish its relative standing with consumers as compared with previous offers. For this purpose, it was decided to use a questionnaire presented in interviews to a cross-section of the female population.[1] A 'pull' of the feature page containing the offer whose sales are to be forecast is obtained several weeks ahead of publication. The investigator shows a copy of this pull to the respondent and gives her a chance to absorb its contents. A series of questions is then asked, mainly in order to present the respondent, step by step, with a picture of the real situation when an offer is sent for. The pertinent questions are as follows:

If you saw this announcement in *Woman* would you say that this offer interested you or not?

If you saw this offer in *Woman*, do you think you would be prepared to cut out the coupon and send the money for the offer?

If it happened that by the time you came to send for the offer somebody had cut out the coupon, would you make the effort of buying another copy in order to send for this offer?

In addition to questions as to marital status and occupation, and the interviewers' assessment of age and social class, the respondents are asked whether, during the last week prior to the interview, they read or looked through a certain number of weekly journals, one of which is *Woman*.

In this way, the amount of interest and buying intentions is obtained, broken down not only by the usual age and class groups, but also by readers of *Woman* and by non-readers. Thus it becomes

[1] In fact, the surveys were carried out in the Greater London area only, in order to save costs. The size of the sample was in each case 1000, stratified by age and class. Only females aged sixteen or over were interviewed.

possible to assess the relative standing of the offer, compared with previous offers, and the various differences of acceptance within the age and class groups, and by readership of the journal. However, this assessment is necessarily very broad, and does not lend itself to a numerical statement as to the number of items of the particular offer that will be bought by the readers of the journal.

The introduction of 'barometer scales' helped the statistical technique to be refined. These are charts containing a picture of a barometer with readings from 0 to 100. Two copies are used in each interview. The first, bearing next to the points marked 100, 75, 50, 25, and 0, words which indicate the degree of interest in descending order[1] is used to ascertain the degree of initial interest in the offer. The second is used later in the interview, after the respondent has stated that she would send for the offer, to indicate the strength of her wish to obtain the article.

The sums of the barometer readings are averaged by the number of respondents in each class and age group, and these averages serve as weights to be applied to the percentages of those interested, those not interested, and those who do not know. An Intensity of Interest Index is obtained by multiplying the percentage of those interested by their average interest score.

When the Intensity of Interest Scores for two or more similar offers are compared it can be seen at a glance which offer has the highest acceptance. The acceptance of the various age and class groups can also be ascertained in this way, and this may yield useful pointers for the writing of future offer features.

Although the introduction of the barometer undoubtedly improves the research findings, it still does not make possible numerical forecasts. For this it is necessary to take account of the sales of previous offers. It was found that sales forecasts based on an offer dissimilar to the one to be predicted did not yield accurate results; therefore all offers were classified in the three groups, cosmetics, household goods, and clothing items, as mentioned before, and forecasts of the sales of a future offer are based on the findings for a past offer of the same group.

If the population would react in exactly the same way to the published offer as the sample of women does to the pull of the offer feature, it would be quite easy to make a forecast. In this case, each per cent of those saying that they would send for the offer, would represent a certain number of sales, and a simple multiplication would result in an exact sales forecast.

It is well known, however, that the number of people who *say* that

[1] Thus, 100 is marked 'Very Interested', and 0, 'Not Interested at All'.

they would act in a certain way is always larger than the number of people who, in the event, *do* so act. This is illustrated by the fact that in respect of a certain offer each percentage point of those saying that they would send for it yielded 5428 actual sales, while each percentage point of those who said the same to another, similar, offer yielded only 1469 actual sales. How then can these two figures be reconciled?

On the basis of experience it was argued that the percentage of those saying they would send for an offer who will actually do so will depend on the price, so that the higher the price of a given offer the lower the percentage who will send. For the purpose of forecasting, it was assumed that the percentage would decrease proportionately to the rise in price; in other words that, in order to forecast the sales from a given offer, the percentage of those who say that they will send for it, both for the offer which serves as forecasting base and for the offer for which the sales are to be predicted, must be deflated by the price of each offer respectively.

This deflating factor is taken into account in the following formula.

$$X_p = \frac{X_o Y_p}{Y_o}, \text{ where}$$

X_p = the sales of the offer to be predicted;

X_o = the actual sales of the offer that serves as prediction base;

Y_p = the quotient of the percentage of readers who said that they would send for the offer to be predicted, over the unit price of that offer;

Y_o = the quotient of the percentage of readers who said that they would send for the offer that serves as prediction base, over the unit price of that offer.

An actual example will make the matter clear. Of offer A, the offer that serves as prediction base, 240,000 items were sold at the price of 1/3 each, when 45 per cent of the readers of *Woman* in the sample said that they would send for the offer. Offer B, the offer the sales of which are to be predicted, costs 2/- per unit and 38 per cent of the readers of *Women* in the sample said that they would send for it; how many units will be sold?

$$X_p = \frac{240. \frac{38}{24}}{\frac{45}{15}} = 127 \text{ approx.}$$

The sales forecast is, therefore 127,000 units.

4. *Results of the Forecasting.* The practical applications of this

sales forecasting formula are not without interest, for they show both its successes and its failures. So far, eight forecasts have been made;[1] the percentage deviations from the actual sales were as follows:

Offer A	— 1.53%
„ B	+ 1.01%
„ C	— 4.47%
„ D	+ 1.01%
„ E	— 4.21%
„ F	+ 12.03%
„ G	+ 79.13%
„ H	+152.55%

On the arbitrary assumption that forecasts with errors up to 5 per cent are full successes, forecasts with errors of between 5 and 15 per cent are partial successes, while forecasts with an error greater than 15 per cent are failures, the table shows that the forecasting for offers, A, B, and D was very good, and that for offers C and E was reasonably good, while the forecast for offer F was a partial success only, and those for offers G and H were complete failures.

It is, perhaps, illuminating to discuss the reasons for the partial success and for the failures. In the case of offer F, the comparable offer on which the forecast had been based was published about a year before offer F; the change in the economic climate of the country between the two dates apparently induced more women in the higher income groups to send for this relatively cheap offer, while a number of working-class women did not send for it; an inspection of the Intensity of Interest Scores of the various social classes fortifies this opinion.

Within the first four days after offer G, a summer dress, coupons came in in a satisfactory manner, and the experts considered that it was yielding the number of sales as forecast. However, four days after publication, rain fell heavily and the temperature became very low, and from then on only a trickle of coupons arrived.

The case of offer H is a very curious one. There are several reasons for the failure of the forecast for this offer. One reason was the omission of a key word from the questionnaire. But the main reason, the existence of which was unknown at the time of the forecast, consisted in the fact that underneath the coupon for the offer another coupon was printed with which the readers could place a regular order for the magazine with a newsagent. Both coupons appeared under the same headline which, to casual readers, seemed to indicate that they could send for the offer only when, at the same

[1] Since this paper was prepared two more forecasts have been made; in both cases the error was less than 4 per cent.

time, placing a regular order for the magazine; many readers may have had still in their minds the pre-war practice of a number of publishers who coupled free and special offers with the taking out of a subscription for a Journal. Since the coupons appeared on a later page that also contained advertising matter, it is certain that large numbers of readers refrained from sending for the offer, erroneously believing that they committed themselves to much more than was, in fact, indicated.

The partial success only of forecasting offer F and the breakdown of forecasting in the cases of offers G and H show clearly how the successful use of the forecasting formula can be vitiated by unpredictable changes in relevant factors.

5. *Extension of the Formula's Use.* The forecasting formula may, however, be used for an additional purpose, for the forecasting of how demand will be affected by changes in the price at which the offer is made. Thus by successive substitutions a table can be constructed from which the total sales, the total turnover and the total profit at each price level can be read.[4] The formula assumes sales to decrease in strict proportion to the increase in price; in other words, the public is more sensitive to a price increase at a lower than at a higher price. Given this, it could lead to a policy of maximizing profits by raising the price and sacrificing a number of sales.

However, these results should not be taken too far. Each commodity has, in the minds of the buying public, a lowest and a highest price limit; this is true even if the public themselves are only vaguely aware of it. If the price is below this limit, fewer people will buy the commodity than would be shown by the formula through continuous substitution because a number of potential buyers will grow suspicious of the quality of the commodity offered. On the other hand, buyers' resistance will be experienced if the price is beyond the psychological limit. Where these actual limits are cannot be discovered by the application of the sales forecasting formula. In addition, competition restricts, of course, the price range at which

[4] As an example, the following table shows the substitutions beginning with a price of 1s. 3d. to a price of 1s. 9d. for the same article.

Price per Unit	*Profit per Unit*	*Total Sales*	*Total Turnover*	*Total Profit*
sh	*d.*	'000	£	£
1s. 3d.	2	226	14,125	1,883
1s. 4d.	3	213	14,200	2,663
1s. 5d.	4	200	14,167	3,333
1s. 6d.	5	189	14,175	3,938
1s. 7d.	6	179	14,170	4,558
1s. 8d.	7	170	14,167	4,958
1s. 9d.	8	162	14,175	5,400

It can be seen that with increasing price total sales fall proportionately, while the total money turnover remains stable. Therefore, total profits increase very rapidly.

a certain commodity can be marketed. The experience from which the formula has been constructed has been from commodities sold as special offers, and, therefore, having the attraction that their prices were *below* those at which they would regularly be available through ordinary channels of distribution. It does not follow that such results would obtain for prices which were higher than 'outside' competitive prices. As in so many other fields of economic activity research can provide only a base for decision; the decision itself has to be made by the businessman whose experience tells him how far he can go.

6. *Conclusion.* Forecasting is generally agreed to be one of the most important tasks of the statistician in business. The attempt at forecasting, as described in this note, is by no means exact, but the practical results have been sufficiently good to serve as a guide to the decision makers, provided no unpredictable elements make themselves felt.

Beyond its practical usefulness, however, and subject to the qualifications made earlier, the relative success of the forecasting formula suggests two general conclusions. The first is that a consumer's intention of buying a commodity is less likely to be negatived for low-priced commodities than for high-priced ones, so that there may be more uncertainty of consumer conduct for commodities whose prices are high in relation to normal budgets. This conclusion is outside the scope of usual economic theory, which is concerned with actual happenings and not with intentions.

The second conclusion is that for high-priced commodities, price increases have less effect on the stability of demand intentions than similar absolute increases will have on lower-priced commodities. The economist would perhaps expect this, since the same absolute increase in price has lower proportional significance the higher the initial price of a commodity.

A further interesting point is the implication of the forecasting formula that the effective demand for special offers of this kind has unit elasticity. This has had its empirical justification — theoretical justification is another matter and without further evidence can only be speculative.

It would be interesting to have the forecasting formula here described applied to other businesses and to other methods of selling. It seems likely that it would be useful to them, perhaps adapted and modified as necessary. The author would be pleased to co-operate with other market research practitioners if they would experiment with its use.

LONDON

THE EFFICIENCY OF THE ROAD HAULAGE INDUSTRY UNDER NATIONALIZATION

by P. E. Hart

In its report for the year 1952, the British Transport Commission (B.T.C.) gives some measurements of the changes in the efficiency of the British Road Services (B.R.S.), as shown in Table I. In the first instance it cites the increase in the number of miles worked by vehicles in 1952 over the corresponding figure for the previous year. This increased efficiency is attributed in part to the increase in the ratio of *indirect* staff to *direct* staff: critics who suggest that there are too many administrators miss the point that efficient organization today requires this high ratio. If the total amount of work done is compared with the number of people employed, the claim of increased efficiency is reinforced because the number of employees per 100 tons carried decreased, or, what amounts to the same thing, the tonnage carried per person increased from 1948 to 1952.

TABLE I

	December 1948	*December* 1951	*December* 1952
Number of Total Staff			
Per motive unit owned	2.52	1.93	1.84
Per 100 tons carried	3.09	2.22	2.25
Number of Managerial, Administrative and Clerical Staff			
Per motive unit owned	0.51	0.39	0.38
Per 100 tons carried	0.62	0.45	0.47
Number of Driving Staff			
Per motive unit owned	1.18	1.04	0.96
Per 100 tons carried	1.44	1.20	1.17

Source: B.T.C. *Report and Accounts* for 1952, p. 38.

On the other hand if it could be shown that the increase in the operational efficiency is the direct result of the monopoly possessed by the B.R.S. in long distance road haulage, the figures in Table I would diminish in importance. It is possible for a road transport monopoly to obtain high efficiency, measured by figures of tonnage or ton miles, at the expense of lowering the quality of service, which is not readily measured by statistics. For example, the element of time is extremely important in the valuation of transport services and this may be forgotten by a monopoly:

> Full loads secured by transporting goods from a number of points to a clearing centre and then loading them on to large lorries employed on trunk services to other clearing centres, and then

> transshipping them to smaller lorries for final distribution, may be very wasteful of time, and in the case of high-value merchandise carried on bank overdraft at 5 or 6 per cent, and also wanted quickly for manufacture in a seasonal trade, are extremely uneconomical. The chief advantage of road transport was its adaptability and promptness in handling small quantities which now seems to be lost.[1]

This type of decline in quality may have been outweighed by other improvements, but this is doubtful in view of the opinions of some Chambers of Commerce,[2] traders and the trade journals which suggest that quality of service has decreased. Against this, we must set the reports of the B.T.C. which suggest improvements in the quality of service and point out the fall in the number of complaints and claims.[3] It can hardly be claimed, therefore, that, over the whole period of nationalization, there has been such a fall in quality that the B.T.C.'s figures of increased efficiency can be completely discounted. Perhaps there has been an element of monopoly present in the working results of the B.R.S., but this must not be stressed in view of the fact that the B.R.S. does not really possess a complete monopoly in long distance road haulage; it is possible for a trader to operate his own vehicles under a C-licence, and furthermore, the B.R.S. has had to reckon with illegal competition from private hauliers (*pirates*) who have been ignoring the 25 mile limit and have been carrying long distance traffic.

However, the number of C-licensed vehicles has increased, and this, together with the increased haulage of goods in *pirate* vehicles, conflicts with the claim that the B.R.S. is becoming more efficient. If their efficiency were increasing we should expect them to be expanding their market whereas they are in fact losing traffic to outsiders. This anomaly suggests that the figures in Table I should be examined more closely and that alternative measures of efficiency should be made.

[1] I am indebted to Sir Henry Clay for this point.

[2] e.g. Liverpool Chamber of Commerce *Report on Road Transport 1951*. This report also complains about transshipment, saying that it 'appears to be on the increase in nationalized road operation. Outstanding among the many examples quoted to the Chamber are three instances of ships being missed owing to trans-shipment delays, with considerable expense to the shipper as a result and often further journeys, which should have been unnecessary, to another port. Similar troubles of trans-shipment apply, in their varying ways, to inward and home traffic'.

[3] Professor Gilbert Walker also claims that quality increased, at least in 1952. 'The improvement in the organization and consequently of the service offered by B.R.S. during 1952 was marked. A great part of the improvement is undoubtedly due to the fact that the former independent hauliers who serve as group managers are becoming increasingly diligent as bureaucrats in the discharge of their duties to the whole of the undertaking of which they are now only a part.' 'Transport Policy before and after 1953', *Oxford Economic Papers*, March 1953, p. 100.

We should perhaps start by trying to obtain indications of changes in efficiency in the administrative sector, because of the possibility of managerial diseconomies arising from the increased scale of operation or from some other aspect of nationalization. If these have arisen in the B.R.S., the administrative sector would have expanded relatively to other sectors. Consequently, Table II gives an analysis of administrative costs and of the numbers of administrative workers.

TABLE II

	1948	1949	1950	1951	1952
Administrative Costs					
£'000	2095	4871	7468	8897	9537
% of Total Working Expenses	15.9	13.0	11.7	11.8	12.6
% of Total Working Expenses less Maintenance Costs	17.9	14.9	13.7	14.0	15.0
Administrative Workers	4654	10441	11445	12307	11387
Per 1000 tons	—	0.384	0.247	0.262	0.271
Per motive unit	0.56	0.30	0.29	0.30	0.29
as % total staff	20.1	15.5	15.2	15.3	15.7

Source: B.T.C. *Reports and Accounts* 1948-52.

These figures must be interpreted with caution and this is especially true for the figures of employees; the administrative coverage has changed over the period 1948-52 in such a way that the numbers of administrators are reduced for the later years. Without being adjusted for this effect, Table II shows that the number of administrators rose from 1948 to 1951 and then fell in 1952, but these figures must be related to output and size before they can be used as tests of managerial diseconomies. Following the practice of the B.T.C., as shown in Table I, we relate the number of administrators to the tonnage carried and to the number of vehicles, though these calculations are made for each year instead of comparing 1948 and 1952. Table II also shows that the overall comparison made by the B.T.C. masks some interesting year to year changes. The ratio of administrators to tonnage hauled may have fallen from 1948 to 1952 but it has been rising continuously since 1950. Similarly the number of administrators per motive unit may have fallen 1948-52 but this fall was achieved in the year 1949 and since then the figure has shown no tendency to fall. In both cases the impression of increasing efficiency created by Table I turns out to be somewhat misleading on closer examination.

To supplement these measures we may calculate the ratio of administrators to total staff. Like the previous ratio it fell sharply 1948-9 though it tended to rise from 1950 to 1952. These series suggest that the overall increase in efficiency in Table I was obtained

in 1949. Perhaps the relative fall in the number of administrators in this year can be explained by the fact that the B.R.S. started with an administration and then began to nationalize the larger firms, with high proportions of administrators, i.e. high proportions relatively to those in the smaller firms nationalized later. This logical programme of acquisition has had the statistical effect of exaggerating the number of administrators in 1948 and thereby emphasising the fall to the more normal level in 1949.

Financial measures of administrative efficiency confirm the results of the physical measures. The fall in administrative costs as a proportion of total working expenses 1948-52 was due to a sharp fall in this figure from 1948 to 1949. Since 1950 administrative costs have undoubtedly been rising relatively to other costs in spite of the fact that taxes on fuel, licence duties and wages have all been increased. The figure for administrative costs has been expressed as a percentage of total costs in order to counteract the effects of the acquisition programme and of inflation in increasing the absolute figure. The B.T.C. claims that the cost of maintaining vehicles has been subject to extraordinary increases due to the failure of their previous owners under private enterprise to maintain them in good condition once they knew they were to be nationalized. Consequently, the figure of administrative costs is also expressed as a percentage of total working expenses less these maintenance costs. Table II implies that a suspicion of managerial diseconomies arising in the large scale operation of road haulage may not be so wildly wrong as the B.T.C. report would have us believe. Both the physical and the financial measures of efficiency show evidence of administrative diseconomies, at least since 1950. However, another possible explanation of these figures is that the administrative sector is increasing simply because such growth is necessary before operational efficiency can be raised. The next step then is to try to measure changes in operational efficiency and see whether this has increased with the increase in administration.

In its fifth annual report the B.T.C. also gives us some indications of changes in operational efficiency in terms of miles per vehicle at work and in terms of tons hauled per person employed. Unfortunately, it is impossible to calculate the former series before 1951 so we shall have to rely on the figures of tonnage for a basic measure of output, and relate them to the number of vehicles and to the number of employees. This is done in Table III. The tonnage figure for 1949 does not relate to a whole year because throughout 1949 nationalization was taking place and the figures therefore apply only to that part of the year in which the vehicles belonged to the B.T.C.

Acquisitions continued after 1949 — though on a diminished scale — so that subsequent tonnage figures should be raised relatively to the figure for 1952 by which time nationalization was complete. However, even the unadjusted figures in Table III show that the tonnage hauled per vehicle and per employee fell each year since 1950, the first year of a roughly comparable series, and that the corresponding figure per member of driving staff fell from 1950 to 1952. These measures confirm the impression of declining efficiency.

TABLE III

	1949	1950	1951	1952
Tonnage carried per vehicle	779	1165	1138	1067
Tonnage carried per employee	404	616	586	579
Tonnage carried per member of driving staff	707	1122	1085	1112
% Empty Running	19.0	18.8	17.8	19.0
% Idle Vehicles	—	—	14.9	17.1

Source: B.T.C. *Reports and Accounts* 1949-52.

On the other hand, the proportion of the total miles run by empty vehicles declined from 1949 to 1951, though the percentages themselves seem rather high in view of the alleged ability of an organization of the size of the B.R.S. to operate its own clearing system. The transfer of tonnage from tramp vehicles to regular trunk services could be expected to decrease the proportion of empty running even if it inconvenienced the customers, but in actual fact in 1952 this proportion increased to the high level of 1949, so that over the whole period under consideration there has been no improvement at all.

It would be helpful if we could supplement these physical measures of overall efficiency by calculating some financial measuring rod. The usual measure is profit as a percentage of capital, in the economic sense of value of assets employed. In the report for the year 1952 the B.T.C. claims that the working surpluses of the B.R.S. from 1948 to 1952 represent a weighted average return of some 4 per cent per annum on the value of the tangible assets employed.[4] This figure, argues the B.T.C., under-estimates the return in so far as the working results have been diminished by the inability of the B.R.S. to increase freight rates rapidly enough to offset increased taxes and costs in a period of inflation. Even so, this figure is still very small, especially as the returns considered are working results and not profit after the payment of interest charges. Since the B.T.C. does not allocate interest charges between the various executives we shall have to estimate the magnitude of the contribution which should be made by the B.R.S. in order to arrive at a figure of profit.

[4] B.T.C. Fifth Annual *Report and Accounts* for 1952, p. 17, para. 36.

Interest charges are by far the largest item in central charges and amount to some £222 million over the five years in question. Over the same period the working results of the B.R.S. amount to some £6 million so that in order to have a positive profit after interest charges only 3 per cent of the interest must be attributable to the B.R.S. If the B.R.S. employs more than 3 per cent of the capital of the B.T.C. then it should be expected to contribute more than 3 per cent to the total interest charges. Therefore the question of whether the B.R.S. has made any profit at all revolves around the question of what proportion of the tangible assets of the B.T.C. is employed by the B.R.S. Though it is possible to calculate the value of the tangible assets of the B.R.S., it is not possible to calculate the corresponding figure for the B.T.C. so we shall have to rely on the net book values to give us guidance in estimating the appropriate allocation of interest charges. The net book values of the tangible assets of the B.R.S. do in fact amount to some 3 per cent of the corresponding figure of the B.T.C., which suggests that the B.R.S. should be expected to contribute on the average about 3 per cent of the interest charges. Since the nationalized road haulage service has just managed to earn 3 per cent of the total interest charges, we can say that it has just about broken even over the five years of its operation. However, when this zero or negligible profit is compared with the profits of private hauliers, over the same inflationary period, it is very difficult indeed to agree with the claim of the B.T.C. that 'the sum total of the financial performance of the British Road Services certainly cannot be said to prove failure or inefficiency':[4] on the contrary, any firm with the financial result of zero profit after five years can be suspected of economic inefficiency.

Each series of figures used in reaching this conclusion is open to criticism but these figures are all that are available to the commentator. Each particular measure has its own drawbacks, and its implications are correspondingly suspect, but each series acts as a check on every other series and they all indicate that under nationalization the road haulage industry has become less efficient each year since 1950, the year for which the first reliable measurements of output are possible.

This conclusion does not mean that the B.R.S. has become less efficient simply because its scale of management has increased, for increases in size and in inefficiency may have gone together without there being any causal connection between them. However, the fact that the statistical tests of administrative efficiency did yield evidence consistent with managerial diseconomies suggests that increasing

[4] B.T.C. *Annual Report* for 1952, p. 18, para. 37.

scale may be part of the explanation. This possibility may serve to mollify the disappointments of those who are coming to believe that substantial economies of scale are being achieved from internal traffic clearing and regret the abandonment of nationalization.

UNIVERSITY COLLEGE OF WALES, ABERYSTWYTH

A NOTE ON LABOUR TURNOVER AND THE INDIVIDUAL FACTORY

by Hilde Behrend

I

This note proposes to examine some conclusions from the recent work on labour turnover of the Tavistock Institute.

Labour turnover is part of the wider problem of labour mobility, and is usually measured by the labour turnover rate which expresses the number of workers leaving a firm during the year as a percentage of the average number employed. Ideally, from the point of view of the requirements of a dynamic economy, the amount of labour turnover should be enough to ensure a sufficient supply of labour for expanding industries and occupations and no more. Any additional movement represents waste. In present-day England labour turnover is from this standpoint excessive and frequently represents a movement away from jobs where the workers are, in fact, needed. For this reason the problem of labour turnover has attracted considerable attention in the post-war years. Excessive mobility, however, can only be limited if we know the factors which determine it and if we can alter them.

Research into labour turnover is therefore concerned with discovering the factors which determine the rate of leaving jobs, and all the available evidence suggests that labour turnover is not simply a question of economic market considerations, but is determined by the interaction of numerous factors, involving both economic and non-economic motives. Some of these factors operate in the whole community and affect all firms while others are at work solely in a particular firm. While all these factors operate simultaneously, some of them exert a stronger influence over the level of turnover than others. Opinions differ, however, about the weights which must be attached to the various factors. Some writers emphasise the importance of external factors in determining the level of labour turnover while others stress the significance of the influence of the individual firm. The Tavistock writers (Rice, Hill and Trist) belong to the group which considers labour turnover to be primarily a function of specific internal factors operating in a particular factory. Since this view appeared to clash with my own findings which showed the overriding importance of external factors and revealed a statistically significant relationship between the level of labour turnover and the level of employment(1), I was led to examine the Tavistock arguments and to evaluate them critically.

This examination appeared all the more important because the arguments of the Tavistock writers have given rise to a re-orientation in the outlook and method of labour turnover research. We find Cook(2) appraising the results and the possibilities opened up by the 'new approach', and Wickham(3) conducting a similar study in an Australian factory. Others may be tempted to follow.

II

Rice, Hill and Trist(4) claim to have conclusive proof that the bulk of a firm's labour turnover is a 'function of an industrial organisation as a social institution', and especially a function of the factory's structure and culture.

Using Kurt Lewin's field theory as a basis, they try to fit labour turnover into a theoretical sociological framework and put forward the hypothesis that it is a quasi-stationary social process.

Their arguments are based on two main propositions. The first one postulates that labour turnover must not be considered as an isolated event — a worker leaving his job — but as a special process that covers the whole movement of workers through the plant from the moment of entry to the moment of leaving. They write(4):

> This paper describes a new approach to the problem of labour turnover, by representing the way in which employees pass through a company as a distinctive social process with a pattern of its own. Current approaches to labour turnover have tended to restrict investigation to concern with the rate at which employees leave a company. Here, the total process will be considered by which an industrial institution both replaces its leavers and accommodates itself to the consequent continuous change in the composition of its labour force. Attention will be directed to the relationship between engagements and terminations rather than to that between terminations and numbers employed, and the method of study will be to follow up entrants rather than to investigate leavers.

This type of analysis, however, is not new. Florence(5) quotes a report by Greenwood, written in 1919, in which the 'survivorship method' of the study of new entrants is used, and Greenwood and Smith(6) give a detailed account of this approach in 1936.

'Every firm', they write, 'has a record of the industrial birth and death of each individual it employs', and they show that from these records it is easy to analyse the survivorship and wastage of new entrants, and they give detailed applications of the method to two industrial organizations.

The second and far more important proposition of Rice and his colleagues deals with, what they call, the 'pattern of labour turnover', and puts forward the concept(4) 'of labour turnover as a process which is a function of the institution, and which has a particular form in a given factory'. This pattern is represented by a graph showing the survival periods (length of service) of a particular group of entrants, and it is claimed that this has two properties:

1. That the pattern is 'regular' which apparently means that the points on the graph approximate to a smooth curve which is described by a hyperbolic function. Rice writes(7):

> 'When the lengths of service of all the employees engaged by the Glacier Metal Company during the years 1942 to 1945 were calculated and a chart drawn showing the numbers who had survived for less than six months, for six months but less than a year, for a year but less than a year and a half, and so on, it was found that the points on the chart approached very closely to a smooth curve. In other words, the lengths of service for all those who entered Glacier from 1942 to 1945 and who left between 1942 and 1949 conformed to a regular pattern'. Further(4) 'To the data could be fitted a hyperbolic function with a general form $\eta = a\xi^{-b}$.

2. That the pattern is 'constant' which means 'constant for succeeding groups of entrants'. Rice writes(7):

> By the use of this method (the analysis of the survival of entrants) it has been found that in two factories the labour turnover process conforms to a constant and regular pattern.

Hill expands this point(8) when he puts forward the hypothesis

> that this survival pattern exhibits the properties of a quasi-stationary process. That is to say that the distribution presented is not only regular, but, unless the institutional characteristics change, constant for succeeding groups of entrants.

I have no quarrel with the first claim. If the data for 1604 entrants over a five-year period are amalgamated it is only to be expected that some smooth mathematical curve will adequately represent the distribution of lengths of service. But this is no more than an arithmetical curiosity unless in addition the pattern is constant over time — that is, unless the *same curve* [and not merely a curve of similar form] represents the pattern for two or more different succeeding groups of entrants. Only in such circumstances can the pattern be of value for purposes of prediction or be called a

pattern at all, and represent a useful tool in the study of labour turnover. But unfortunately the pattern does not seem to be constant.

If there exists a constant pattern of labour turnover there will be no statistically significant difference between the length of service distributions for two succeeding groups of entrants. From the data given in the first article by Rice and his colleagues(4) it is possible to compare the figures for 1942 with those for 1943-45. In the table which follows, the basic information for 1942 and for 1942-45 is that given by Rice, Hill and Trist. The data for 1943-45 were derived by subtraction.

PARTICULARS OF TWO STREAMS OF ENTRANTS AT THE GLACIER METAL COMPANY*

Year of Service	Survival period in weeks	Entrants in 1942 No. leaving	Entrants in 1943-45 No. leaving	Entrants in 1942-45 No. leaving
First	0–25	203	288	491
	26–51	98	159	257
Second	52–77	78	95	173
	78–103	58	52	110
Third	104–129	45	42	87
	130–155	31	29	60
Fourth	156–181	55	27	82
	182–207	38	18	56
Fifth or more	208 or more	144	144	288
Total no. of entrants		750	854	1604

* Compare text for source of information.

CALCULATION OF CHI-SQUARE

Year of Service	Survival period in weeks	Entrants in 1942			Entrants in 1943-45		
		No. leaving			No. leaving		
		Expec'd value	Diff. between obs. and exp. val.	Contribution to chi-squared	Expec'd value	Diff. between obs. and exp. val.	Contribution to chi-squared
First	0–25	230	−27	3.17	261	27	2.79
	26–51	120	−22	4.03	137	22	.53
Second	52–77	81	−3	.11	92	3	.10
	78–103	51	7	.96	59	−7	.83
Third	104–129	41	4	.39	46	−4	.35
	130–155	28	3	.32	32	−3	.28
Fourth	156–181	38	17	7.20	44	−17	6.57
	182–207	26	12	5.54	30	−12	4.80
Fifth or more	208 or more	135	9	.60	153	−9	.53
Total no. of entrants		750			854		

On the assumption of the null-hypothesis, namely that there is no significant difference between the proportion of leavers for each year of service for the two groups of entrants, expected values of the number of leavers may be calculated, and the distribution in 1942 and 1943-45 may be compared by the chi-square test. The value of chi-square is 42.50 with eight degrees of freedom; the difference between the 1942 and the 1943-45 stream of entrants is thus statistically significant at the .001 level. In other words, there has been a significant change in the pattern for two succeeding groups of entrants; the claim that the pattern is constant is therefore seen to be unfounded.[1]

Yet it is on this constancy of the labour turnover pattern that the claim is based that labour turnover is a function of the institution. Major external events, it is argued, did not affect the pattern; they only caused fluctuations in the level of labour turnover.[2] The Tavistock team considers 'Short-term fluctuations as a function of the prevailing type of work contract; and longer term fluctuations as a reflection of the changing pattern of wider social and economic forces, as those affect a particular firm', but they conclude that 'consideration of these fluctuations suggests that there is a considerable and relatively constant basis'(4). These statements do not seem to me to make sense. A reduction in the rate by almost 50 per cent (from 27.0 per cent in 1946 to 14.7 per cent in 1948) can hardly be considered an 'undulation' and be reconciled with the view that the labour turnover process is constant. A reduction in the *level* of turnover which — as the Tavistock team admits — is due to external events is likely to alter the so-called *pattern* of turnover, because the impact of external change affects entrants for different years simultaneously. This means that it affects different groups of entrants after different periods of service.

If one takes the end of the war as an example of an important external event, it is possible to study its effect on the level and

[1] In his latest paper(9) Rice also finds a statistically significant change in the pattern of labour turnover for male entrants for the periods January 1st, 1942, to June 30th, 1945, as compared with July 1st, 1945, to December 31st, 1948. Rice attributes this change to institutional factors. 'The measures introduced by the governing system [he writes] are shown to have reduced the rate of leaving of male entrants after they had already survived for longer than six months.' Hill(8) also gives particulars of changes in the pattern during and preceding the redundancy crisis at the Glacier Metal Company in 1949, and claims that the data 'are consistent with the hypothesis that the survival pattern returned to its previous level after a period of disturbance', but he admits that 'the evidence regarding the level of the process at the end of our three-year period is inconclusive'. Wickham's data(3) for an Australian factory also showed no constancy. The author writes: 'Statistical tests did not produce acceptable evidence that the whole of the data could be regarded as a process conforming to a constant and regular form.'

[2] The figures given(4) show that the turnover for men at the Glacier Metal Company was lowest in 1948 (14.7 per cent) and highest in 1946 (27.0 per cent); for women it was lowest in 1947 (35.1 per cent) and highest in 1945 (53.7 per cent).

pattern of labour turnover. Published evidence shows (compare, for instance, Long, 10) that most factories experienced a rise in labour turnover rates during the period 1945-46. The Glacier Metal Company was no exception; its turnover rate rose sharply in 1945 and remained high in 1946. It is generally accepted that this rise in factory labour turnover may be attributed to the end of the war and the Tavistock writers are in agreement with this view.

One would expect that the external changes connected with the end of the war which caused this rise in the level of labour turnover were felt by the entrants for different years at the same point of time but after differing periods of service. The effect of the end of the war on the 1942 entrants would be shown in the above table for their third and fourth year of service; similarly the 1943 entrants would be exposed to the effect in their second and third years, the 1944 entrants in their first and second years, and the 1945 entrants in their first year. The figures support this view. Of the 1943-45 entrants 70 per cent left during their first two years of service as opposed to only 58 per cent of the 1942 entrants. Similarly, only 5 per cent of the 1943-45 entrants left in the fourth year after entry, compared with 12 per cent of the 1942 entrants. The large differences between observed and expected values for leavers in the first and fourth years emphasise the differences in exposure of the two streams of employees to the events of 1945 and 1946. This provides evidence that external events help to shape the pattern of the labour turnover process.

III

From the above arguments it seems permissible to conclude that the evidence given by Rice, Hill and Trist is insufficient to substantiate the claim that labour turnover is a quasi-stationary process and that its pattern is a function of an industrial organisation as a social institution. On the contrary, it has been shown in this note that the data for the Glacier Metal Company reveal that the labour turnover process has been shaped by external events. This does not mean that the individual firm has no influence on labour turnover, but the importance of its influence is difficult to assess and frequently overrated. The case in favour of its significance made out by the Tavistock writers must be rejected as not proven. The proofs themselves were found to be unacceptable.

It would appear that little can be gained from the type of approach and analysis used by Rice, Hill and Trist. There is no need for elaborate sociological or psychological terms nor for mathematical formulae where these do not serve a useful purpose (such as prediction) and where ordinary words can be made to convey the meaning

far more adequately. This form of academic window-dressing should be avoided by social scientists at all cost, unless it is absolutely essential. The mere use of elaborate terms and mathematics in the analysis of human behaviour are not sufficient to constitute a scientific method. Scientific method consists in the selection of the most efficient and at the same time simplest available method of analysis which is appropriate to the subject matter.

UNIVERSITY OF BIRMINGHAM

REFERENCES

1. Behrend, H. (1953): 'Absence and Labour Turnover in a Changing Economic Climate', *Occupational Psychology*, Vol. 27, No. 2, pp. 69-79.
2. Cook, P. H. (1951): 'Labour Turnover Research', *Journal of the Institute of Personnel Management*, 33, pp. 2-9.
3. Wickham, O. P. (1952): 'Labour Turnover as a Dynamic Process', *Bulletin of Industrial Psychology and Personnel Practice*, Vol. 7, No. 2, pp. 3-12.
4. Rice, A. K., Hill, J. M. M. and Trist, E. L. (1950): 'The Representation of Labour Turnover as a Social Process', *Human Relations*, Vol. III, No. 4.
5. Florence, P. Sargant (1924): *Economics of Fatigue and Unrest*, London, Allen & Unwin.
6. Greenwood, Major and May Smith (1936): *Sickness Absence and Labour Wastage, Part II*, Industrial Health Research Board Report, No. 75.
7. Rice, A. K. (1950): *A Study of Labour Turnover*, Tavistock Institute Document No. 253.
8. Hill, J. M. M. (1951): 'A Consideration of Labour Turnover as the Resultant of a Quasi-Stationary Process', *Human Relations*, Vol. IV, No. 3.
9. Rice, A. K. (1953): 'An Approach to Problems of Labour Turnover', *British Management Review*, Vol. 11, No. 2.
10. Long, J. R. (1951): *Labour Turnover under Full Employment*, Monograph A2, University of Birmingham, Studies in Economics and Society.

COTTON AND WOOL TEXTILES— CASE STUDIES IN INDUSTRIAL MIGRATION

by James A. Morris

Shifts in the location of major industries are rare phenomena and when they occur a means is provided for empirically testing location theory. The migration of the cotton textile industry from New England to the Southeast, which began early in the century and is still in progress, has provided a wealth of material for locational analysis. More recently the woolen and worsted industry, basically located in New England and the Middle Atlantic regions, has expanded significantly in the Southern Piedmont area. Comparison of the factors involved in the relocation of plants in these industries will serve to add meaning to previously-held concepts on the location of economic activity.

The theory of industrial location in a dynamic society, where economic adjustments can be made more or less freely, is concerned with the factors which determine the ideal or best location of particular industries. Alfred Weber's approach was to consider the location of industry from the standpoint of transfer costs and tended to be highly abstract. Transportation costs were considered to be uniform for all commodities or areas, and geometric devices were used to determine locations based on analysis of one raw material, one factor and one finished product. This over-simplified analysis has limited usefulness in empirical study of actual migration, especially in the case of light industries where all factors are transferable. Location analysis must involve evaluation of resources, transport conditions, processing and markets. A breakdown of location factors on the basis of the activities of an enterprise into transfer and production operations provides a realistic context within which the migration of the textile industries may be examined.[1]

The textile manufacturing industries in the United States develõped initially in New England on the basis of certain locational advantages including availability of capital, entrepreneurial ability, immigrant labor, and proximity to markets. Raw materials were readily available in the South but capital and entrepreneurial ability were tied up in agriculture, especially in cotton. The rebuilding of the economy of the South necessitated by the Civil War and Reconstruction Period provided the opportunity and incentive for the building of cotton textile plants in that region. The subsequent shifts in location of this industry and current shifts in the related wool

[1] Hoover, E. M., *The Location of Economic Activity*, New York, 1948.

textile industry have occurred in the dynamic context of general industrialization of the South and the relative decline of the economy of New England, affected by technological improvements, population shifts, the emergence of new textile fibers, and other changes.

COTTON TEXTILES

In 1880, when the cotton textile industry began to develop in the South that region had one-twentieth as many spindles as the North, and produced an insignificant portion of the product of the industry. By 1952, 81 per cent of active cotton spindles were in the Cotton States, with North Carolina and South Carolina competing for first place in active spindleage.[2] The southern growth was consistent from 1880, but it was not until the late 1920s that the South surpassed the North in number of spindles. As a matter of fact the early part of the century was a period of active development of the industry as a whole, and that portion of the industry in New England continued to expand until 1920. Overcapacity became a problem in the 1920s and the number of spindles decreased thereafter with the impact of decline falling on the northern segment. Actual relocation of plants reached a zenith in this decade, although the post World War II era has witnessed a continuation of this movement. Between 1923 and 1948, for example, ninety cotton textile plants either liquidated in or moved from Massachusetts, removing an investment of $112,258,358 and employment of 74,347 workers.[3] It is true that the first plants in the South were built by local subscriptions and loans, but later plants were the result of expansion by northern firms.

Census data on establishments in selected areas indicate that between 1880 and 1947 New England's proportion of plants of the industry decreased by about 50 per cent while there was a more than five-fold increase in the proportion in the Southern Piedmont States of North and South Carolina, Virginia and Georgia. Data on the geographical distribution of active spindles in 1925 and 1952 present an even clearer picture of the extent of shift in operations.

SPINDLES IN OPERATION
(in millions)

	Cotton-growing States	*New England*
1925	17.3	16.0
1952	18.9	4.0

Source: American Cotton Manufacturers Institute.

The nature of the migration is clearly indicated by these data.

[2] American Cotton Manufacturers Institute, Charlotte, N.C.

[3] The Commonwealth of Massachusetts, *Report of the Special Commission Relative to the Textile Industry*. May 12th, 1950, pp. 5-9.

When the industry ceased expanding the burden of contraction was borne by the high-cost plants in the North.

Initially the southern cotton textile plants primarily produced coarse goods, then fine goods manufacture shifted, and finally in the last two decades the finishing division has also been relocating. Improvement in skill of the labor force and the managerial force in the South made possible the movement from the simpler to the more complex processes. Between 1899 and 1919 Census data show that New England's share of the production of yarn of numbers 20 and under fell from 35.8 per cent to 24.4 per cent, while its share of the production of number 41 and over fell from 92.9 per cent to 70.5 per cent.

Further migration was retarded by World War II and the period of recovery which followed when all facilities were needed and profits were made even by marginal plants. Subsequently the problem of overcapacity has re-entered the picture and many plants producing high-quality goods have relocated in the Piedmont. Cotton mill activity in New England during 1952-53 averaged between 55 per cent and 85 per cent of activity during the base period 1935-39.[4] The basic factors causing movement continue to place New England plants in a disadvantageous competitive position and relocation can be expected to continue.

How can the migration of all divisions of this major industry be explained? One analyst has stated the answer quite succinctly, 'the ultimate basis of producer preference for locations is the rate of earnings obtainable at different places'.[5] Data on comparative profit rates for cotton textile plants in different regions are not readily obtainable, but it is possible to contrast factor costs in areas of varying economic structure. The technique is to price the most efficient combination of factors in each region.

The cost structure for cotton textile establishments is dominated by raw material costs, averaging about one-half of the wholesale cloth prices.[6] Production wages and salaries represent the larger share of mill margins and average about one-fourth of value of product. Other costs of lesser importance include depreciation, taxes, fuel and power, and selling and administrative expenses. Cost proportions vary markedly for various types of mills and various style goods produced, but the surpassing importance of raw material and labor costs is typical throughout.

'From the cotton-fields to the cotton mill' is a statement used by

[4] First National Bank of Boston, *New England Trends*, March 31st, 1953.
[5] Hoover, E. M., op. cit., p. 6.
[6] U.S. Department of Agriculture, *Marketing and Manufacturing Margins for Textiles* Washington, 1945, pp. 48-65.

casual observers to describe the desirability of orientation of cotton textile plants to raw material sources. While the early development of the industry in the South was undoubtedly stimulated by the accessibility of the raw material, any cost advantage derived from this fact was dissipated by the growth of the industry and the shift in the center of cotton production to the Southwest. One estimate is that in the 1890s Carolina Piedmont mills had an advantage in the transport cost of cotton of 0.8 to 1.5 cents per pound of coarse product over mills in the Merrimack Valley in Massachusetts.[7] An even more significant transfer cost advantage was provided at this stage when southern railways provided special low shipping rates on finished cotton products to offset their competitive disadvantage in terms of distance to the northern markets. Once the southern branch was established, however, the railroads reverted to the normally higher rates for finished products, so that southern plants operated at a cost disadvantage in shipping to northern finishing mills or markets. As the industry grew in the South its cotton needs outran local supply, and in addition as finer grade products were manufactured choicer cotton was needed, so that southern plants reached out further for raw material. Foreign cotton has only been shipped to the South and processed there in recent years. Prior to that it was obtained primarily through Boston.

Transfer cost differentials do not provide, therefore, rationale for the migration of cotton textiles. Cotton is not a heavy weight-losing material and there has not been a significant differential between shipping costs of raw material to northern or southern plants. Any savings provided by southern locations have been offset, at least until the last two decades, by higher costs of shipping finished products to finishing plants or directly to the garment industries. The psychological advantages of available cotton unquestionably influenced the establishment of pioneer plants in the Piedmont, but, as has been indicated, this factor was soon dissipated.

A more significant factor in explaining movement is the sizeable differential in labor costs between northern and southern plants, and this still exists. Because of the high proportion of labor costs to value of product, and even more significantly, because those costs constitute the major share of the mill margin, this industry may be considered as labor oriented. The favorable differential in labor costs for the South has been and is the result of both lower wages and higher productivity of textile operatives.

The difference in wages constitutes a transfer-cost differential to

[7] Chen, Chen-Han, *The Location of the Cotton Manufacturing Industry in the United States, 1880-1910*, an unpublished PhD thesis on file at Harvard University.

some extent because of variations in cost of living, but a more important explanation is the immobility of labor. The South has been an area of population pressure with a productive and adaptable textile labor force. Poor alternative opportunities for employment, location of plants in rural areas, and lack of extensive unionization are also pertinent explanatory factors. An investigation by the Department of Commerce and Labor in 1907-08 disclosed the following differences in average weekly full-time earnings for specified cotton textile workers in 44 New England and 151 Southern Mills:

	New England	*Southern*	*Per Cent N to S*
Ring Spinners (male)	$6.77	$5.96	114
Spoolers (female)	6.77	5.71	119
Weavers	9.93	8.53	117

Source: Copeland, M. T., *The Cotton Manufacturing Industry of the United States*, Cambridge, 1923, p. 46.

Predöhl estimated that the wages of textile workers in North and South Carolina were 20 to 30 per cent lower than in Massachusetts in the 1920s, including an adjustment for mill village costs.[8] In March 1952, average hourly earnings for cotton textile workers were $1.17 in the Southeast as contrasted to $1.38 in New England and $1.47 in the Middle Atlantic region.[9] The fact that New England specializes in combed yarn products while the southern plants are primarily engaged in processing carded yarn makes overall comparison difficult, but individual comparisons verify that a general differential does exist. The differential has narrowed somewhat through the influence of the threat of unionism, government legislation on minimum wages, and the development of the southern economy, but wage costs continue to be lower in the South by 5 to 10 per cent.

Even if wages were identical in these two areas labor costs would be lower in the South because productivity tends to be higher. Work assignments have been traditionally larger for southern textile workers, partially because of the greater adaptability of workers and to some extent because of more modern machinery and plants. A firm of textile engineers recently laid out on paper a completely modern mill of 450 looms and concluded that 118 workers could operate the plant in the South, but that 158 would be needed in the North.[10] Feasible work assignments were considered to be considerably larger in the South. Further studies could be cited leading

[8] Predöhl, Andreas, *Die Sudwanderung der Americanischen Baumwollindustrie*, Weltwirtschaftliches Archiv, 29, 1929. (Translated by A. G. Smith, Jr.)

[9] U.S. Department of Labor, *Earnings of Cotton Textile Workers, March 1952*, Washington, May 1952.

[10] *Report on the New England Textile Industry* by Committee Appointed by the Conference of New England Governors, Boston, 1952, p. 168.

to the conclusion that workloads have been and are significantly different in northern and southern plants. The fact is that southern workers have been much less workload conscious and have been amenable to scientifically designed job assignments. In addition the tempo of technological change has been more rapid in southern plants, and management has been more willing to experiment with new fabrics and techniques. The automatic loom, for example, was developed around the turn of the century, and was adopted much more readily by southern plants. Despite the difficulty of accurately comparing productivity of plants in the absence of identical conditions, whatever data is available leads to the conclusion that, generally speaking, southern workers are more productive.

The differential cost of fringe benefits to labor, which must be included in the price of labor, reacts to the disadvantage of the northern segment of the industry. Early in the development of cotton textile producing in the South, benefits to workers other than wages were higher than in northern plants. With the advent of strong unions and the passage of more liberal unemployment insurance and workmen's compensation legislation in northern states, more and costlier benefits, such as paid holidays, group insurance, and unemployment payments, are received by workers in these states than by their counterparts in the South. It has been estimated that the difference in 1952 amounted to eight and one-half cents per hour, accounting for one-half of the wage differential.[11] The conclusion is inescapable that differences in labor costs and attitudes have constituted the fundamental economic basis for movement of cotton textiles from New England to the Southeast.

Other factor costs, however, have tended to influence the decision-making process and to counterbalance the adverse costs of transporting finished goods to market. Power and fuel costs have been and are substantially lower in the Southeast than in New England, because of a difference in climate and in production and transportation costs. Southern plants need less fuel because of the milder climate, and transportation costs are less because of the greater accessibility to major coal-producing areas. Power costs are lower because of a greater dependence on lower cost hydro-electric power and partially because fuel and other costs are cheaper for steam plants. Thus, these are transfer cost differentials to a considerable degree. A study made by an outstanding engineering concern in 1949, which compared power costs in a hypothetical plant in various regions, demonstrated this differential and concluded that a cotton textile plant in the South Atlantic States with a capacity of 22

[11] Ibid, pp. 36, 37.

million yards of cloth per year on a two shift basis would save $34,100 per year as compared with an identical plant in New England.[11] Power and fuel costs, however, constitute only a small proportion of value of product so that these savings would not be location determining in themselves; but they are factors considered when locations are chosen. In the hypothetical case discussed savings would constitute ¾ of one per cent of value of product and .5 per cent of investment required.

Variations in tax costs for manufacturers of cotton textiles in different areas are not substantial in relation to total costs, but they have some importance psychologically-speaking. A survey by the Federal Reserve Bank of Boston in 1949 indicated that 52 per cent of textile manufacturers responding felt that taxes were an important cost disadvantage in New England. It is extremely difficult to make accurate regional comparisons of tax burdens, but the evidence available suggests that high property taxes on manufacturing in New England and exemptions given by southern states provide the basis for the attitudes expressed. Locational change would certainly not be made for tax savings, but this factor might add weight to the pull southward.

Other factors have played a minor role in the migration of the industry, including lower construction costs in the South, more favorable community attitudes, and a more agreeable climate. On the other hand, New England manufacturers have operated in plants which have long been written off and transportation costs to market have been lower for these plants.

In summary, then, the movement to the South represents an attempt by manufacturers to improve their cost positions in an intensely competitive industry. The nearness to cotton fields was a significant psychological factor early in the movement, but labor cost and other differentials provide more logical explanations for the continued migration. These differentials continue to bring about movement, although they have lessened in amount.

WOOL TEXTILES

The production of woolen cloth has been carried on in the Southeast since colonial times, but the more complex processes involved in manufacturing worsteds have come more recently. In the last three decades, and especially since 1945, there has occurred a rapid growth of wool manufacturing facilities in the Southern Piedmont while the number of plants in the industry as a whole has remained substantially the same and machinery in place has

[11] *Comparative Power Costs in Textile Mills*, Charles T. Main, Inc. Boston, March 1949.

declined. There is a differential rate of growth in favor of the Southeast, which suggests a migration in wool textiles comparable to the exodus of cotton mills from New England to the South.

The number of plants in the four key southern states — Virginia, North and South Carolina, and Georgia — increased from 26 in 1939 to 59 in 1951, and machinery, employment, and value added have increased concomitantly. This contrasts with the situation in New England where wool mill activity during the first quarter of 1953, for example, was about 80 per cent of the average for 1935-1939.[13] This was a period of depressed activity for the whole industry, but its impact was felt especially severely in New England. Prior to 1939 most southern plants were locally owned, but the majority of plants built since then have represented expansion by northern firms. Of the major producers of woolen and worsted products the majority have branch plants in the Piedmont, including the important American Woolen Company, which has recently acquired two plants and synthetic producing facilities in the South. The first modern worsted plant in this area, Southern Worsted Mills, was organized in Greenville, South Carolina, in 1923, and between that date and 1951, 29 other worsted plants were established in the four Piedmont states. At least five per cent of the capacity of the woolen and worsted industry is located in these four key southern states, and there is every indication that growth will continue.

As in the case of cotton, raw material costs constitute the most important item in the cost structure of woolen and worsted plants. The major wool market is in and around Boston, where scouring and combing facilities are located. This means that southern plants incur additional raw material transportation costs of approximately two cents per pound. Since the apparel industries are also located in the North, the southern wool manufacturer faces higher transportation charges on wool cloth than New England producers. A survey made by the author indicates that the transportation cost differential amounts to approximately four or five cents per yard of wool cloth against the southern plants.[14] Processing costs, therefore, would need to be significantly lower in the Piedmont, and must more than compensate for the adverse transfer cost differential, if there is an economic basis for the growth of the industry in the South. The evidence available indicates that, as in cotton textiles, labor costs, power and fuel costs, and possibly tax costs, are lower in the South.

Labor costs constitute the major proportion of value added in the

[13] First National Bank of Boston, *New England Trends*, March 31st, 1953.
[14] James A. Morris, *Woolen and Worsted Manufacturing in the Southern Piedmont*, University of South Carolina Press, 1952, p. 145.

wool textile as in the cotton textile industry, and significant differentials between regions exist in wages, fringe benefit costs, and in work assignments, providing a locational pull to the South for woolen and worsted production facilities. Wage rates for southern wool textile workers are based on rates for comparable employees in cotton textile plants and are considerably below wages paid to similar workers in New England. Therefore a double differential exists between wages of southern and northern woolen and worsted employees; one between woolen and cotton rates in the North, and the other between northern and southern cotton textile wages. Average hourly earnings for woolen and worsted production workers in April-May, 1952, were $1.50 in New England and $1.19 in the Southeast, a differential of approximately 20 per cent. The differential exists for all types of production workers; for loom fixers it was 20.4 per cent, and for women battery hands it was 23 per cent.[18]

To emphasize the southern advantage in labor costs, it may be well to repeat that the price of labor includes many items other than wages which must be examined to derive a complete picture of regional cost differentials. All evidence available demonstrates that fringe costs to include holiday and vacation pay, insurance and pension plans, and shift differentials are lower in the South. Workmen's compensation and unemployment costs also tend to be lower in the Piedmont states. The cost differential results from lesser benefits and lower basic wage costs upon which benefits are based. Most plants everywhere offer health and life insurance plans, but retirement pension plans are non-existent among southeastern wool textile plants and are provided by a minority of New England mills. There is a striking difference in the extent to which paid holidays are available: the report cited above shows that formal provisions are furnished by approximately 90 per cent of New England as compared with about 20 per cent of southeastern plants. The majority of New England production workers on the second and third shift receive extra pay while less than 10 per cent of southeastern workers on these shifts are so compensated.

The same factors explain these differential wage and fringe costs in the southern woolen and worsted industry as in the cotton. They include the lesser strength of unions in the South, the location of southern plants in rural areas where alternative opportunities are less favorable for workers, and the tendency of the scattered southern plants to adhere to the pattern of wages set in the cotton textile

[18] U.S. Department of Labor, 'Earnings and Related Wage Practices in the Woolen and Worsted Industry, April-May 1952', *Labor News Release* (Washington, August 12th, 1952).

industry. Basically, however, the differential can be explained by the difference in resource patterns of these competitive areas; the supply of labor for industry is growing more rapidly in the South because of higher population growth rates and displacement of workers from agriculture where basic changes are taking place in production techniques.

Labor costs are more than a function of wage and fringe benefit costs and worker productivity must be given equal consideration. Definitive data on comparative productivity of production workers in various segments of the woolen and worsted industry are not available, and indeed could not be determined accurately unless identical plants were being compared. Work assignments in terms of machines tended by weavers, spinners and similar workers do tend to be greater in Piedmont plants. A survey made by the author in 1950 provided evidence that work loads were considerably higher in southern mills and that workers were willing to adapt to workloads set by time study methods on an objective basis. At that time weavers in New England were tending an average of six looms while weavers on comparable goods in southern plants handled as many as fourteen and averaged at least eight. Similarly, spinners of worsted yarn in Piedmont mills were handling twice as many sides. A mere comparison of equipment tended does not provide unequivocal evidence that productivity of these workers is higher in the South because machinery, raw materials, organization, products and other factors may vary. The data do disclose greater willingness of southern workers to adapt to realistic work assignments as contrasted with the adamant attitude of the typical New England woolen or worsted production worker who will not countenance any change in equipment tended. There can be little question that once southern workers are properly trained in wool textile skills their willingness to handle workloads determined by time-study methods leads to higher productivity in southern plants than in comparable New England factories. Manufacturers who have had experience in both areas corroborate this concept; for example, one woolen producer stated to the author that 145 production workers in his southern plant turned out the same volume of production as 215 production workers on identical equipment in his New England plant. This evidence fails to offer conclusive proof that there are large regional differentials in productivity of woolen and worsted workers, but it does tend to that conclusion. The more definitive evidence available in the similar cotton textile case also would substantiate this conclusion.

The costs of labor, therefore, tend to be significantly lower for

southern than for New England wool textile plants where other conditions such as machinery, skill of management and raw materials are comparable. The far from conclusive evidence available would indicate a differential of at least 20 per cent in such costs, less the cost of training workers in new skills. In recent months some success has been achieved in experimenting with higher work assignments in New England plants, but current market forces are not operating to reduce appreciably the sizeable wage differential in the two regions. Long-run forces such as a better balance of supply and demand for industrial labor in the South, increased strength of unionism in that area, government wage legislation, and greater adaptability of New England workers brought on by fear of unemployment may lead to equalization of wages, fringe benefits, and productivity. Such equalization cannot be forecast, however, for the immediate future, which means that labor cost differentials will continue to provide an incentive to locate in the South.

As in the case of cotton textiles, power and fuel costs are significantly lower for woolen and worsted plants in the southern Piedmont, although the impact of this factor on total costs is not substantial. These costs represent only 2 to 3 per cent of total value of product so that differentials are not as influential for locational decision-making as those for labor costs. Manufacturers, however, are aware of differences and they serve to add weight to the locational pull or to counteract the adverse transportation cost differential for southern plants. Fuel costs are at least 10 per cent cheaper in the South because, as has been pointed out, of the lower transportation expenses incurred and because of reduced needs caused by a milder climate. In the absence of rapid development of commercial atomic power or other technological development these differentials will continue to exist.

There is little definitive evidence on tax differentials, although manufacturers express opinions that for comparable plants in the two regions these costs are lower in the South. The property tax is higher for the New England manufacturer, and Southern states are more willing to give tax exemptions for industrial plants. Tax cost differentials do not substantially affect total costs, and tax structures are in a constant state of change so that their importance in locational decision-making is not as great as some other factors. It is also true, nevertheless, that manufacturers are conscious of tax differences and that this factor reacts at least to the temporary advantage of the South.

Other costs play a less important role in decisions by manufacturers to relocate or expand toward the Southeast. Depreciation costs are

higher for southern plants because plants in New England have been substantially written off. Construction costs are not as high in the South, however, and the modern, one-story, air-conditioned plant permits greater efficiency of operation. Both regions possess adequate facilities in terms of suppliers, technical personnel, and research facilities.

The overall picture, then, discloses significantly lower costs for southern woolen and worsted plants as compared with their New England counterparts. There are no short-run forces in operation which would indicate that labor and power and fuel cost differentials would be eliminated or appreciably narrowed in the foreseeable future. Rather it would appear that there will continue to be a gradual displacement of wool textile facilities to the Southeast in the absence of fundamental alterations in underlying factor conditions.

UNDERLYING FACTORS IN MIGRATION

A mere comparison of factor costs in different regions does not disclose the dynamic nature of the migration of these industries, although it provides information on the economic rationale behind the movement. The relocation of the cotton textile industry and the expansion of wool textiles toward the South have occurred in the context of dynamic changes in economic and technological conditions in the economy and in the industries concerned. An examination of some of these major influences will serve to illuminate the forces at work and to explain why the movement of woolens and worsteds has followed rather than led the exodus of cotton textile activity.

A factor of considerable significance, already mentioned but which should be emphasized, has been the greater willingness of southern textile firms to accept technological change. The classic example is the development of the automatic loom, which was put into use more rapidly in the South as indicated by the proportion of automatic to total looms in each area at two periods:

	New England	*South*
1914	26.4	41.6
1929	59.1	80.3

Source: Michl, H. E., *The Textile Industries*, Washington, 1938, p. 154.

Another improvement, this time in cotton textile spinning, the Casablanca or long-draft spinning technique, was rapidly adopted by southern plants. In the last few decades there has occurred a virtual technological revolution in textiles which has reacted to strengthen the competitive position of the progressive firm. Southern manufacturers have led the way in the production of worsted yarn using the

long-draft or 'American' system based on the use of modified cotton textile machinery. Because cotton frames are faster and because processes have been reduced under this system, substantial savings in labor, overhead, and machinery costs have been realized. By 1951 a quarter of a million spindles were operating on this system, and most of them were in the South. Other devices to improve processing of textile fibers, such as the Pacific Converter and the pin-drafter, both of which shorten preparatory processes prior to spinning, have been installed at a faster rate in southern plants. A relatively new weaving device, the Sulzer Loom, has just been installed in one of the two new southern plants of the American Woolen Company instead of in one of the 21 northern plants.

The reluctance of northern manufacturers to install the most modern equipment is to some extent a reflection of a placid frame of mind resulting from the maturity of the industry. Third and fourth generation owners have tended to be more concerned with regular dividend payments than with plowing back profits to improve capital facilities in order to keep up with competition. Basic cotton textile techniques had reached their full development early in the nineteenth century and the New England producer was not concerned greatly about southern competition until a substantial migration had occurred. The pioneer southern manufacturers and the progressive northern firms which expanded toward the South were in a position to experiment with new methods. Furthermore, with a labor force more adaptable to change, the savings resulting from more productive machinery were not dissipated by workers insisting on tending the same amount of the new as the old equipment. Woolen and worsted producers have been attempting for some time to persuade weavers to accept loom assignments based on cloth style and operating conditions rather than continue the practice of considering four or six looms to be a full load under any circumstances. Some plants have actually been closed in New England when employees have unequivocally refused to experiment with any changes in machines tended. This attitude has retarded the introduction of such devices as the pin-drafter because of the difficulty of handling the problem of displacement of workers. The easy way out, consequently, has been for manufacturers to build or buy plants in the South and to experiment with new machinery and processes there. The inevitable result has been the gradual closing out of northern units when competition becomes more intense.

The introduction of new synthetic fibers into the textiles field has also had an impact upon the location decision-making process. Rayon, first produced commercially in the United States in 1911, is

directly competitive with cotton in many uses, and, in addition, is used as a blend with wool. By 1951, 18.5 per cent of mill consumption of fibers in the United States was rayon while cotton consumption declined from 88.9 per cent in 1920 to 71.2 per cent in 1951.[14] In the last decade several wool-like synthetics have been developing and are now providing a threat to wool as a fiber for warmer garments. Orlon, Dacron, Dynel, Acrilan, and other synthetic fibers are now being utilized to produce fabrics for women's and men's garments, and their popularity is growing. In addition, these new synthetic fibers often are substituted for a proportion of wool to make blended fabrics. Competition from these new fibers, which are more uniform in quality and more stable in price than natural fibers, has had some influence in the movement of both cotton and wool textile plants to the South.

A large portion of the synthetic fiber industry is located in the Southeast, although, during the early stages of growth, the industry tended to locate in the Middle Atlantic States. Orlon is produced in South Carolina, Dacron in North Carolina, and post World War II rayon plants have been built in and around the Carolinas. Synthetic fibers have been processed to some extent by existing cotton textile and wool textile plants, and also by plants specializing in the production of synthetic yarns and fabrics.

The introduction of new fibers, as with improved machinery, has stimulated competition in the textile industries and has made existence more difficult for marginal plants. Progressive manufacturers have tended to accept synthetic fibers as a favorable development and to blend them with natural fibers or to set up facilities to process them into yarns and fibers. The more dynamic nature of the southern industry has meant a more ready acceptance of synthetics and thus a competitive advantage. The gradual centralization of synthetic fiber production in the Southeast, especially in the case of the wool-like fibers, has meant greater accessibility to such raw materials and lower transportation costs for southern textile manufacturers.

Changes in the composition and attitude of the textile labor force have affected location materially. Throughout its history the industry in New England has depended to a considerable extent on immigrant labor, first from northern and later from southern Europe. The use of immigrant workers had a tendency to hold down wage rates and to provide a source of tractable, productive labor. Descendants of these workers have tended to be less satisfied with textile jobs and less willing to accept lower wages than those available

[14] 'Textile Fiber Consumption', *Textile Organon* (New York, March 1952), p. 74.

in alternative fields. The South, on the other hand, is and has been a region with an expanding industrial labor force due to a high birth rate and the displacement of workers from mechanized agriculture. It has been estimated that during the twenty years ending in 1965, two million southern workers will be displaced from agriculture because of technological advances.[17] Southern workers have been amenable to management-determined workloads and to wages set in relation to alternative opportunities. Once the problem of training has been met southern textile workers prove at least as productive as their northern counterparts.

There can be little question that the growing strength of labor unionism since 1933 has affected management thinking on the question of relocation. Few plants can be considered as 'runaway' in the sense that the existence of a union in a northern plant was the major factor causing movement, but migration has been influenced indirectly. The textile unions of both major federations have been successful in organizing the majority of New England textile workers, but it is doubtful whether more than 10 per cent of such workers in the Southeast are represented by unions. Only four of the fifty-nine woolen and worsted plants in the Piedmont are organized, for example, at this time, and no such mill established in the post 1945 period has a union representing its employees. Despite persistent and vigorous attempts to organize southern textile operatives little progress is being made by unions. The reasons for lack of success are manifold, including: strong resistance from management, lack of interest on the part of workers with a rural-bred aversion to unions, location of plants in rural towns far from centers of union strength, antipathy of communities to labor organizations, and the practice of anticipating union demands by unorganized mills.

This differential degree of textile union organization between regions has necessarily had an impact upon the comparative costs of producing yarns and fabrics. Unions engaged in their normal activity of collective bargaining have been instrumental in widening the labor cost differential between plants in New England and the Southeast. Each time wages have been raised, or paid vacations or holidays won, or separation pay added to the agreements in unionized plants in the North and lesser benefits gained by workers in the Southeast then the gap in labor costs has increased. Awareness of the importance of complete organization if competition on the basis of labor costs is to be eliminated has stimulated the textile unions to

[17] U.S. House of Representatives, 80th Congress, 1st Session, 'Study of Agricultural and Economic Problems of the Cotton Belt', *Hearings before the Special Sub-Committee on Cotton of the Committee on Agriculture*, July 7th and 8th, 1947 (Washington, 1947) p. 622.

large-scale drives in the post 1945 era. These attempts were not successful, however, and since the disastrous 1951 southern-wide textile strike the position of southern unions has weakened absolutely.

Evaluation of the textile industries without at least commenting on the problem of foreign competition would involve the omission of a most significant factor, both economically and psychologically speaking. Tariff protection has been enjoyed by textile manufacturers since 1816 and the threat of large-scale importation of foreign-made products has colored the thinking of producers in recent decades. Concern over imports has been enhanced by the Reciprocal Trade Agreements program and by the existence of overcapacity in both the cotton and wool textile industries. The principle sources of competition have been Great Britain and Japan. In actuality, however, imports have constituted a small proportion of total domestic production, although some types of goods have been affected disproportionately — fine goods by English and coarse goods by Japanese competition. The emergence of low-cost producing facilities in other parts of the world has tended to reduce appreciably the volume of American exports and hence to accentuate the problem of overcapacity in the domestic industry. From the viewpoint of regional competition this loss of markets has weakened the position of marginal or high-cost plants, and at least in the case of cotton textiles, may have stimulated migration to the South in order to reduce costs. It is doubtful that foreign competition has affected location in the woolen and worsted industry in any tangible manner, except to the degree that cost-consciousness has been enhanced. The volume of imports, for example, was only 2.7 per cent of domestic production in 1950, according to Tariff Commission figures. A tentative conclusion is that foreign competition has played an indirect and minor role in influencing the movement of textile producing facilities.

CONCLUSIONS

Despite the difference in timing involved, the relocation of cotton and wool textile producing facilities appears to have been motivated by fundamentally the same economic considerations. Production techniques and factor cost structures in these industries are similar, and product markets are located in the North in both instances. These are intensely competitive industries, with a relatively small degree of concentration of control, and small differences in the price of factors may determine whether a plant will liquidate or prosper; and the data available indicate that differentials have persisted between New England and the Southeast and still exist. In each case

the critical factor appears to be labor costs, which is the most important element in value added. Textile wages and fringe costs are clearly lower in the South and productivity tends to be higher once workers have been trained. The costs of transporting raw materials to plants have been slightly lower for southern cotton textile plants but higher for their wool textile counterparts, because the principal wool center of the nation is Boston. Transportation to market for southern plants in both industries has been more costly due to the concentration of garment-producing facilities in northern metropolitan areas. Other costs, not as locationally significant as worker costs, such as power and fuel costs and property tax costs, tend to be lower in the southern locale. New England textile plants have a capital cost advantage stemming from operation in plants which have long been written off, but this factor is to a considerable extent counterbalanced by the lesser operating and maintenance expenses available in the modern plants being built in newer production areas. An adequate quantity and quality of research facilities, technical personnel, and accessory suppliers are on hand in both areas. There is no evidence that the labor, power and fuel cost advantages accruing to southern plants will be vitiated in the foreseeable future. The industrial labor force continues to grow at a rapid pace in the South and there is slight prospect that textile unions will soon accomplish their goal of complete southern organization. Fuel sources are located so as to provide continued low transportation costs to the Southeast and it is extremely unlikely that New England can develop lower-cost hydro-electric facilities to the same degree as the Piedmont states.

Locational change does not occur in a vacuum and in the case of textiles migration has proceeded in the context of rapid technological change, the emergence of competitive man-made fibers, changes in the tastes of consumers from heavy, quiet fabrics to colorful, light fabrics, competition from foreign producers, and the growth of powerful labor unions. Overcapacity, resulting from improvements in production methods, shifts in demand, and changes in the intensity of operation has tended to exert great pressure on marginal plants and thereby has stimulated movement. In addition, the shifts in textile producing facilities have affected and been affected by the relative decline of the New England economy and the emergence of the industrial South. The dynamic nature of these changes has placed a premium on adaptability and progressiveness, always easier to attain in a young industrial area than in a mature region such as New England, where past production methods, once profitable, have been adhered to. In public discussions of the issues involved labor

leaders have placed the onus of lack of advanced techniques on New England manufacturers, who in turn have criticized the lack of adaptability of the work-force to new and improved methods. Whatever the reasons, however, the differential rate of acceptance of technological change has reacted to the advantage of the southern branches of the textile industries.

Granting that fundamentally the same economic factors are involved in the expansion of woolen and worsted production toward the South as in the migration of cotton textiles, a question inevitably arises as to why the movement of wool textiles was so long delayed. If larger profits could have been made in the South in 1900, or 1920, or 1930, why did woolen and worsted producers not relocate? To some extent, at least, the Southeast has not been prepared to engage in the more complex processes involved in manufacturing worsteds, although woolens have been produced since colonial times. An area which is developing industrially moves through successive stages, concentrating at first on processes requiring unskilled labor in large numbers, and as it matures engaging in manufacture requiring skilled labor and more refined techniques.[18] The history of cotton textile migration illustrates this concept: coarse goods only were first produced in the South, later fine-goods manufacture was attempted, and the finishing industry is still in the throes of a large-scale movement which reached its peak in the post 1945 period.

The migration of cotton textiles also seemed to be more natural because of the accessibility of cotton; from cotton-fields to cotton-mills became a virtual symbol of the liberation of the South from its post Civil War condition of poverty. It is now known that this is not of material significance, but in contrast, the wool market and the wool fabrics market have both been centered in the North, raising the issue of high transportation costs and lacking the psychological appeal of cotton. Then, too, skills required in producing worsteds were higher than in cottons and errors in production were much more costly because of the higher value raw materials.

Technological improvements in manufacturing worsteds, to include experiments with production on modified cotton machinery, the emergence of synthetic competitors for wool, and problems of overcapacity resulting from technology and consumer taste changes have also been significant factors in explaining the enhanced interest of worsted manufacturers in southern locations.

The first modern southern worsted plant was established in 1923

[18] For a development of this viewpoint see: Taylor, Charles T., 'The Revival of an Old Industry, Sixth District Wool Manufacturing', *Monthly Review* (Federal Reserve Bank, Atlanta) May 31st, 1948.

and was followed by experimental plants started by northern manufacturers in the 1930s, most of them using modified cotton machinery. The successful experience of these manufacturers soon became common knowledge in the industry, and the prosperity of the post World War II period provided an opportunity for expansion of test plants to the South by manufacturers. By 1950 almost all major worsted firms had branches in the South and several firms were gradually displacing all of their facilities in that direction. The redirection of wool textile plants, therefore, gives every evidence of being part and parcel of a long-run shift in the locus of textile production from New England which began when cotton textile plants were built in the South in the 1880s. The same basic factors operative in the relocation of cotton textile manufacturing have been instrumental in shifting wool textile plants, albeit delayed somewhat until manufacturers were convinced that quality wool products could be made in the South at lower costs than in New England.

UNIVERSITY OF SOUTH CAROLINA, UNITED STATES

A NOTE ON STOCKS

by Sir Henry Clay

In the last two years the National Income Blue Book has given estimates of changes in business and government stocks. In the following Table these changes are given — for companies only, since these give the best indication of trading conditions — and compared with movements in Fixed Assets and Tax provisions. (*National Income and Expenditure* 1948-1952: Tables 39, 45, and 20):

TABLE 1

United Kingdom
Companies' Fixed Assets, Stocks, Tax Payments and Tax Reserves
(£ million)

Year	*Fixed Assets*	*Stock Appreciation*	*Value of Physical Increase in Stocks*	*Tax Payments*	*Additions to Tax Reserves*
1948	507	200	189	566	199
1949	541	189	17	745	−16
1950	612	475	−13	774	56
1951	637	500	442	711	469
1952	631	23	−187	910	157

It will be observed that expenditure on Fixed Assets expanded regularly. This was to be expected, since such expenditure is usually on a long-term plan, based on technical considerations and, therefore, difficult to interrupt without serious waste, and practically impossible to reverse — however pressing a company's need of cash, it could seldom meet it by realizing uncompleted Fixed Assets. In this period, the rate of expansion was probably limited by difficulty in securing deliveries.

The most fluctuating element was the change in the physical volume of stocks. Rising prices tend to stimulate additions, falling prices to encourage the running down of stocks. Appreciation of stocks and work in progress tends to exaggerate the change in balance-sheets produced by adding to or running down stocks, being the direct result of price changes.

Taxation of profits might be expected to damp down fluctuations in stocks by depleting cash, as rising prices increase the companies' need for cash, and by reducing the pressure of this need, as falling

prices release cash. But this would be so only if taxes on profits, like taxes on Schedule E incomes, were collected as the profits were earned. This is apparently not practicable and the figures of tax payments and provisions show that tax payments tend to lag after profits, and that additions to tax reserves, remaining in the hands of the companies, were on the whole sufficient to finance the increases in the physical volume of stocks.

The effect of this lag in taxation was not serious in the recession of 1951-1952, because it followed six years of expanding profits (and enforced saving), which left industry prepared for a much more serious recession than occurred. In less favourable circumstances, the effect would be to intensify the tendency to add to stocks when prices are rising and to run them down when prices fall. The actual payment of rising taxes is not made until a year or so after the profits have been made, and in the interval, tax reserves are at the disposal of the companies to help to finance the purchases which force prices up. When the turn comes, the pressure for tax payments on high profits made in the past coincides with the decline in profits which accompanies falling prices, and is likely to increase the liquidation of stocks which aggravates recessions.

The treatment of stock appreciation as taxable income must tend to increase this effect. Stock appreciation increases profits but does not increase cash resources, unless and until the stock is liquidated; it increases the *deferred* liability, which has to be met when prices have fallen, and tends to increase *then* the liquidation of stocks and downward pressure on prices.

The figures of stock changes illuminate also the changes in the external economic relations of the United Kingdom. This is brought out if the change in the chief elements in the balance of payments from year to year is shown in the form in which the Current Liabilities and Assets in a trading concern are presented. This is done in Table 2. Sterling balances correspond with 'Creditors', stocks with 'Stocks and Work in Progress', and gold and dollars with 'Cash'; in order to carry the comparison back to 1948, gold is valued throughout on the current basis of £1 = $2.80: a rough estimate of change in stocks in the first half of 1953 is added to bring the comparison forward.

A comparison between a country and a trading concern is, of course, of only limited validity. But it is reasonable to take account of changes in stocks in judging the year's outcome for a country. An increase in stocks involves an immediate draft on exchange reserves, while running down stocks relieves the strain on exchange reserves; on the other hand, an increase in stocks is a potential relief to exchange reserves in the future, and the running down of stocks a

TABLE 2

United Kingdom

Change in chief Current Assets and Liabilities in relation with the Rest of the World

(£ million)

	Liabilities	*Assets*			
Year	*Sterling balances of non-residents*	*Total*	*Gold & $*	*Stocks*	*Balances with E.P.U.*
1948	−173	+73	−80	+153	
1949	+175	−27	−60	+33	
1950	+329	+365	+575	210	
1951	+55	+180	−344	+610	−86
1952	−376	−351	−175	−123	−53
1953 (Jan.-June)	+172	+315	+186	[+100]	+29

potential strain. It would be a misleading picture of a private concern's trade and liquidity, if its balance-sheets gave cash, without showing stocks and work in progress, and the parallel for a country is so far valid.

In the past five years, exchange reserves ('cash') and stocks have varied on the whole inversely — as they tend to do in private business. If they are taken together, the apparent improvement of the country's position in 1950 is much less than was inferred at the time from the growth of gold reserves alone, nor was the deterioration in 1951 so bad; the improvement in 1950 was largely explained by the Government running down its stocks, and the deterioration in 1951 by companies having to build them up again at higher prices. On the other hand, 1952 appears even worse than the movement of reserves suggested, and 1953 better. On the whole, taking reserves and stocks together makes the external position of the country since 1947 almost continuously stronger than the gold figures suggested.

The changes in liabilities have also to be taken into account in judging each year's outcome. The increase in gold reserves in 1950, so far as it was not financed by running down stocks, was financed by incurring additional current liabilities in the form of non-resident sterling balances; the decline in assets in 1952 was more than offset by the reduction in the same liability. The parallel with a private concern, again, must not be pressed too far; but so long as London remains an international banking and clearing centre, it must expect to have large and fluctuating non-resident balances. Nor is a rise in the amount of these balances necessarily a weakness;

any more than an increase in the Deposit liabilities of a Clearing Bank is regarded as a weakening of its position. An international banking centre like London is more vulnerable to strain, due to political fears, than a domestic bank, and must have regard to this danger in the management of its reserves. But it can avoid the danger of strain in only two ways — either by carrying a gold reserve equal to the liabilities, in which case there would be little advantage in having the use of the balances, or by going out of the international clearing and financing business altogether.

OXFORD

EARLY DAYS IN SCHUMANIA

by J. Driscoll

On August 10th, 1952, the Schuman Plan at last became a reality. On that date, the European Coal and Steel Community (E.C.S.C.), came into being, and France, Western Germany, Italy, Belgium, Holland and Luxembourg transferred their sovereignty over the limited but vital field of coal and steel to the new body. The fortunes of the Community will affect Britain so closely that it may be valuable to survey the economic policies of the Community as they have developed in the first seventeen months of its work, up to December, 1953. Since this paper is concerned principally with economic matters, references to political and constitutional issues will be kept to the minimum necessary for understanding.[1] Moreover, discussion will be largely confined to the 'steel half' of the Community.

THE POLITICAL BACKGROUND

The fundamental purpose behind the Schuman initiative was political rather than economic. As after 1918, France sought desperately after 1945 for some certain guarantee against the revival of German militarism. By 1950, however, she was aware that neither continued suppression of Germany as the defeated enemy, nor the balancing presence of U.S. and British troops, could be relied upon in the long run. Security could be achieved only by limiting Germany's power of independent action in some way acceptable to the German nation; and this in turn could be secured only by bringing her into a framework of European institutions with supranational powers.

Against this background of broad policy, coal and steel stood out clearly as the first sector in which the experiment should be tried. In the first place, these two industries largely govern the military power of modern states. France hoped that if Germany's basic heavy industries were brought under European control, any substantial measure of German rearmament would become impossible, except with the agreement of her neighbours. Secondly, the painful contrast between the technical unity and the political division of the Ruhr-Lorraine-Saar coal-steel complex was widely recognized. Any initiative suggesting some measure of political unification here

[1] For a discussion of the Community from a constitutional viewpoint, see Professor Paul Reuter, 'La Communanté Européenne du Charbon et de l'Acier', Libraire Générale de Droit et de Jurisprudence, Paris, 1953.

could rely on widespread support amongst the supporters of European Unity. And finally, France was acutely aware of her comparative weakness in this sector. In 1938, Germany had produced 22.6 million metric tons of steel and 384.8 million metric tons of coal and lignite, as against the French production of 6.2 million metric tons and 47.6 million metric tons respectively. By 1949, Western Germany alone had caught up with the French output of crude steel (excluding the Saar in both totals), and by 1951, W. German production of crude steel had reached 13.5 million metric tons, as against 9.8 million metric tons for France and 2.6 million metric tons for the Saar.

THE SCHUMAN TREATY

M. Schuman's initiative came in early 1950. After long negotiations, the Treaty was signed in April, 1951. Ratification followed, and the Community came into being in August, 1952.

The Treaty provides for five institutions.

(i) The High Authority. The executive body of the Community. Composed of nine members all independent of their national Governments.

(ii) The Council of Ministers. Responsible for reconciling the policies of the Community and of the member States. Normally works on majority decisions, but there is a virtual right of veto on certain matters.

(iii) The Assembly. 78 members. It has power to dismiss the High Authority as a whole, but is mainly conceived as a means of bringing public opinion to bear on the 'technocratic' High Authority.

(iv) The Court of Justice. The final interpreter of the Treaty, which is the source of all the Community's powers: somewhat analogous to the U.S. Supreme Court.

(v) The Consultative Committee. 51 members, including 17 representatives each of producers, consumers (i.e., usually coal-using or steel-using firms) and workers. The main channel for the many consultations formally required by the Treaty.

Though the relations between these bodies were broadly defined in the Treaty, the actual balance of power tends to shift in response to internal political pressures. The powers of the Council of Ministers *vis-à-vis* the High Authority were increased during the negotiating

period, but in the early months the High Authority played the dominant role and the Council remained surprisingly passive. In face of growing economic difficulties in the autumn of 1953, however, the High Authority has had increasingly to rely on the Council to reinforce its authority, and a new Joint Committee has been set up which may well come to exercise effective executive control if the situation worsens. In addition, both the Assembly and the Consultative Committee have begun to assert themselves vigorously. The High Authority appears to have envisaged the Assembly as merely a body meeting occasionally to ratify past executive actions; but the Assembly has in practice forced itself into a position where the High Authority has had to agree to present its plans to it for prior approval. Moreover, it has forced the High Authority to pay much more attention to social and labour questions than the High Authority itself had intended to do.

ECONOMIC AND SOCIAL POLICY

The Treaty, unlike the British Nationalization Acts, does not content itself with setting up an institutional framework and then leaving the controlling bodies free to determine policy within only the broadest of directives. The economic and social policy of the Community is set out in considerable detail. Indeed, this section takes up 31 of the 72 pages of the text. Moreover, one soon becomes aware in Luxembourg that the Treaty is an everyday manual of guidance for the Secretariat, providing the framework within which all action proceeds. In reviewing in the rest of this paper the various economic policies of the Community, we shall have to pay close attention to the provisions of the Treaty in each case.

General Aims. Art. 2 provides that the Community's task is 'to contribute to economic expansion, the development of employment, and the improvement of the standard of living . . . through the institution . . . of a common market (for coal and steel)'. It must aim at 'the most rational distribution of production', while avoiding any sudden disturbances in the economies of the member States. All this must be done, not by direct ownership or control of the various firms, nor by detailed central planning, but with 'limited direct intervention'. The Community's task is to ensure the maintenance of normal competitive conditions; the privately-owned firms shall be left free to operate as they see fit within that market framework, and the Community will take 'direct action with respect to production and the operation of the market only when circumstances make it absolutely necessary' (Art. 5).

As regards the broad expansionist aim, it has rapidly become clear

that the future of the coal and steel industries cannot possibly be divorced from the general economic development of the member States. Unless these pursue monetary and fiscal policies designed to secure a high and stable level of business activity and a high level of investment in the consuming industries, increases in coal and steel capacity will only aggravate economic difficulties. The High Authority has continually been running up against the fact that the final determinants of activity within its sphere of responsibility are outside its power to control. Art. 57 does, indeed, provide for consultations with member Governments in order to ensure a balanced expansion, and such consultations have now begun. But while the several Governments remain free to pursue divergent policies, the High Authority's position must remain extremely difficult. The Federalist groups in the Community see in this overlap of powers and responsibilities a 'fruitful tension' which shows up the impracticability of organizing the European economy except as a whole, under one political responsibility. They hope that the piecemeal and empirical extension of the High Authority's influence in closely related fields (such as indirect taxation, transport, the level of output and investment in steel's raw material and consuming industries,[2] etc.), may in the end force the member States to 'tidy up' the situation and create one governing authority.

As regards methods of work, the High Authority has not so far been able to limit itself to creating a competitive market framework. The great complexities involved in opening up a common market in place of highly protected national markets have forced it to intervene directly in a number of ways, in both the coal and the scrap markets. In the cases of iron ore and steel, however, the easier supply position and the less-distorted market structure allowed the High Authority to leave prices free and to confine itself to its proper task of defining common market rules. The High Authority has remained liberal in its economic ideology; indeed, far from seeking to impose a centrally-planned regime on the coal and steel industries, the High Authority has been more concerned to force producers to give up their cartel thinking and to face the bracing wind of the free market.

Pricing Policy. Table 1 shows the main features of the pricing structure in the Community's steel industries prior to the opening of the common market for steel on May 1st, 1953.

The Treaty requires the adoption of a multiple basing point

[2] E.g., there have been rumours of a plan to place the investment plans of all steel-*transforming* industries under the guidance of the High Authority, which has been blocked only by French opposition: see 'L'Usine Nouvelle', November 26th, 1953: speech of M. Metral, President of the French Syndicat Général des Industries Mechaniques.

TABLE 1

PRICING STRUCTURE, W. EUROPEAN STEEL INDUSTRIES. BEFORE MAY, 1953

Country	*Pricing System*	*Price determinations*	*Imports and Exports*
France	Single basing point system	Maximum prices fixed by Government	Imports prohibited. Exports subject to licensing
Holland	Single basing point system	Industry fixed own prices	No quantitative restrictions
Belgium and Luxembourg	Uniform delivered price	Prices agreed between producers and Fabrimétal (main consumer) with Government approval	
Italy	Ex-works price system	Maximum prices fixed by Government, but actual prices below these	
W. Germany	Single basing point system	Producers and consumers had agreed on prices, under Government supervision, in summer 1952. Government control lifted January, 1953	No restrictions from January, 1953

system.[3] Each firm is required to publish its list of prices and conditions of sale, and to choose its basing point (subject to High Authority approval).. It must then stand ready to supply *any* consumer within the common market, without discrimination by nationality or location, at a price equal to the published list price (including the published 'extras' for odd sizes, small quantities, etc.), plus transport charges from its basing point to the point of delivery. The regulations made by the High Authority have authorized forty-one basing points, five in W. Germany, fourteen in France, six in Belgium, five in Luxembourg, three in Holland and eight in Italy.

Although the Community has determined in this way the pricing system of the common market for steel, it has not attempted to fix actual prices. The firms are quite free to fix their prices at whatever level they see fit, and they are free also to readjust their prices as occasion arises. In order to prevent rapid discriminatory price

[3] The U.K. steel industry uses a uniform zonal delivered price system. The zonal price of any given product increases according to the distance of the zone from the main producing centre, but the price is the same for all consumers within a zone, irrespective of their location.

changes, however, five days' notice[4] must be given of any proposed modification of a published price list, and purely local or temporary reductions designed to drive a competitor out of a market are expressly forbidden.

Firms are allowed to reduce their delivered price below that indicated by the published price plus freight in only two cases:

(i) A firm may 'align' its delivered price on that of a competitor working from another basing point, i.e., it may reduce its delivered price down to (but not below) that of its competitor. In effect, this permits some freight absorption. The High Authority may limit such 'alignment reductions' if they threaten to produce serious shifts in production.[5]

(ii) A firm may align its price on prices offered in the Community area by non-Community firms, subject again to High Authority approval. This is important as regards British competition in and near coastal areas.

All this, it must be repeated, concerns the *framework* of the pricing system only. In normal conditions, the High Authority will not intervene beyond this point, and firms will be free to set their own prices at whatever level they choose, given their costs and the market situation as they see it. The High Authority does, however, possess the power to fix maximum or minimum prices in certain circumstances which are described in later sections.

The common market for steel was opened on May 1st, 1953, and since supply and demand were approximately in balance, prices were left free. The High Authority warned producers, however, that it might fix maximum prices, as it had done for coal and scrap, if prices rose sharply. When firms' price lists were published, they showed a remarkable degree of uniformity, and it has since been admitted that this was the result of a 'gentleman's agreement' suggested by the producers' associations. The High Authority tacitly accepted this collusion. It felt that no other course was to be expected after so many years of controlled prices, and it hoped that firms would come to readjust their prices more closely to their individual cost and market conditions as more experience was gained of this strange new competitive world.

From May onwards, sales and production of most steel products steadily declined, and by mid-summer many firms had begun to accept orders at less than their published list prices. At first, this

[4] Reduced to one day, as from February 1st, 1954.

[5] E.g., the High Authority would be unlikely to allow Ruhr producers to align themselves for sales in Italy on offers from an Italian basing point.

was done in roundabout ways; for example, by providing first quality products at second quality prices. By late autumn, however, almost all pretence of following the published price lists was abandoned, and a 'standard' black market rebate of some 5 to 15 per cent emerged.

These price reductions in themselves were not unwelcome to the High Authority, which was anxious to improve the trade of the re-rollers. Neither did they in any sense involve undercutting official Community minimum prices, since none existed. The disturbing factor about them was that they were discriminatory reductions, varying between buyers, and as such directly contrary to the basic non-discriminatory pricing principles of the Treaty. Instead of making price cuts in the authorized way, that is, by modifying their published price lists and so making the lower prices available to all buyers, the firms were leaving their formal price lists unchanged and making concessions which varied according to the market strength of each buyer.

During December 1953, the question of bringing the pricing regulations in line with market realities — it is significant that the adjustment was seen in that way, and not vice versa — was discussed at length. In order to allow more price flexibility, the High Authority has now authorized steel firms to diverge from their published prices without having to amend their published lists, provided that the average divergence between the realized price and the published price over a 60 day period does not exceed 2½ per cent of the published basis price. This modification, however, falls outside our period.[4]

Much criticism of the pricing system set up for the steel industry has come from both consumers and producers. The system, it is alleged, is unworkable. Though a consumer is, in theory, able to compare all possible offers from Community producers and select the most favourable on the basis of published prices and known freights, the reality is much different. The consumer is faced with over 400 producers in the common market; published price lists are not in practice easy to obtain; when they are obtained, they are in most cases in a foreign language; even when translated, they give prices for 'extras' — an important element in the total price of steel — in terms of national schedules which differ from country to country; and even if the harassed consumer is finally able to compare possible basing point prices, he still has to cope with the still tangled mass of

[4] Decision of January 7th, 1954. Appeals against these changes have been lodged with the Court of Justice by the French and Italian Governments, who hold that the amendments contravene the non-discrimination provisions of the Treaty.

rail and water-borne freight charges. The process, it is complained, is so complex and long-winded that most buyers have simply preferred to keep to their previous suppliers. Moreover, the consumer who braves the complexities of comparing possible delivered prices may still fail to get the supplies he orders. The French engineering Association has alleged that when, as a trial of the non-discrimination principles of the Treaty, twenty-five of its member firms ordered steel from German producers, every one was refused on the ground that no steel was available; and this at a time when nearly all Community producers were working below capacity.

A more fundamental criticism of the pricing system comes from certain producers. It is argued that although the Treaty seeks to secure the theoretical end-result of a free competitive market — one price throughout the market, allowing for spatial differences — it goes about this in a way which inhibits the normal processes by which a single market price tends to emerge. Although a non-discriminatory price is the final outcome of a single competitive market, discrimination by buyers and sellers alike is the essential means by which that uniform price is established and maintained. 'Discrimination', it is argued, is merely an emotive synonym for those constant fine adjustments, those nice marginal shifts, which are the channels through which market pressures exert themselves. The Community's rules require a seller to fix in advance a price suited to the average run-of-the-mill transaction which he expects to meet, and then to stick to that price for all possible bargains, whatever the special situation in each case. The result can only be, either that sellers follow the market and defy the Community's rules, or that the Community enforces its rules against the market trends by means of a growing body of inspectors. In other words, the attempt to obtain the end-result of the free market while refusing its means must end, either in a denial of the letter of the Community's rules by producers, or in a denial of the spirit of those rules — economic freedom — by the Community itself.

Production Policy. Normally, all decisions arising out of the balance of supply and demand in the Common Market will be left to the individual firms, responding as they see fit to market pressures and opportunities. The High Authority has the duty to 'see that the common market is regularly supplied' (Art. 3a), but it must operate as far as possible by indirect means (Art. 57). Thus, in normal times, it will remain content with a watching brief. If supply and demand become seriously out of balance, its first line of action will be to fix maximum or minimum prices, and then to follow up this 'holding' measure by consultations with producers, consumers and

governments in order to stimulate output or 'to regularize or influence general consumption'. Only as a final step, if these indirect measures fail to restore balance, will the High Authority resort to direct intervention in production plans.

If demand falls off very considerably, and indirect action fails to revive it, the High Authority may declare a state of 'manifest crisis'. It can then, after discussions with the Consultative Committee and with the concurrence of the Council of Ministers, institute production quotas (Art. 58). The precise nature of the quota system is not set out in the Treaty. It would appear, however, that 'a reference level' for output will be 'defined by a general decision' (which presumably means the fixing of a percentage of output in a given base period) and that levies will be charged on all excess output and used to subsidize firms producing less than their quota, in order to maintain employment. As an emergency measure, this may be acceptable. If continued over a long period, however, such a scheme would provide a 'feather-bed' for the less efficient producers and prevent desirable shifts in favour of low-cost firms.

If the High Authority finds that a serious shortage of any or all of its products exists, and indirect action fails to restore a balance, it may, unless the Council votes unanimously to the contrary, propose an allocation scheme (Art. 59). On the basis of these proposals, the Council may lay down consumption priorities and allocate the scarce products between the coal and steel industries, other home consumers, and exports. These decisions, however, require unanimity. Failing this, the High Authority may step in and allocate the scarce products among the member States on the basis of their consumption and exports, leaving it to each government concerned to allocate its share as it sees fit. In the last resort, and provided the Ministers concur, the High Authority can require all member States to restrict exports of the scarce products.

To date, neither an over-production nor an under-production crisis has been declared. Direct intervention by the Community in production programmes has not come into effect, therefore, although there were some rumours of production quotas being introduced during the sharp decline in demand in mid-autumn, 1953. The Community's powers in this field have, however, been an issue in discussions on Britain's relations with E.C.S.C. If Britain joined the Community, during any period of shortage, an allocation scheme operated by a High Authority which was not particularly concerned with Commonwealth links might well cut across the whole system of Commonwealth Priorities, which so powerfully reinforces the system of Commonwealth Preferences.

Finance and Investment. Since the war, sizeable investment programmes have been carried through in the Community's coal and steel industries.

TABLE 2

GROSS INVESTMENT IN COMMUNITY COUNTRIES
(*Millions of E.P.U. units of account*)

Year	1949	1950	1951	1952	*Total*
Coal industry	500	460	450	550	1960
Steel industry	280	340	400	550	1570
Total	780	800	850	1100	3530

(Provisional estimates. Includes amortization. Figures for coal industry include housing construction for miners.)

The normal sources of finance (the capital market and the banks) have been unable to meet these investment needs, while the general scarcity of investment funds in face of reconstruction demands has meant that the cost of financing expansion through the market has been heavy.[7] As Table 3 shows, there has been much reliance on self-financing,[8] and a very important part has been played by Government aid (including U.S. aid).

TABLE 3

FINANCING OF GROSS INVESTMENT, E.C.S.C.

Source of funds	1948–52		1952	
	Coal	*Steel*	*Coal*	*Steel*
	%	%	%	%
Self-financing by firms	37	40	44	40
Banks and Capital Market	12	30	31	26
Government aid: home	19	13	21	27
foreign	32	17	4	7
Total	100	100	100	100

Under the Treaty, the High Authority does not itself initiate or carry through investment programmes. That remains the responsibility of individual firms. It may, however, work out general plans

[7] In most E.C.S.C. countries, the long-term rate of interest for industrial enterprises has been around 8-12 per cent, as against approximately 6 per cent in Britain and 4-5 per cent in the U.S.A. Thus for new European steel-works, the interest element in the cost per ton of steel would be roughly twice that involved in Britain or the U.S.A. The interest element in steel costs is only about 4 per cent, however, so the effect of this difference on prices cannot be considerable.

[8] German steel prices, in particular, have contained a large profit margin for the self-financing of investment. This must be remembered when comparing home prices in different countries as a guide to cost comparisons.

for development in the light of its forecasts of long term demand, and publish these for guidance. Moreover, it may require firms to submit their development plans for examination, and may issue reasoned opinions of the projects involved.

The High Authority cannot prohibit any project outright. If it disapproves, however, it has two powerful weapons at its disposal.

(i) If the project is one which would not be viable without special State aid, the High Authority can forbid the firm to finance it out of resources other than its own reserves; that is, it can forbid recourse to the capital market, etc.

(ii) If the project, while not requiring special State aid, is nevertheless regarded as undesirable on other grounds, the High Authority may publish an unfavourable opinion on it. This does not prevent the firm approaching outside sources for funds; but it makes it extremely unlikely that any outside sources will be found willing to take the risks involved.

When the High Authority approves of a project, it may assist the firm financially, either by granting it a direct loan, or by guaranteeing a loan raised by the firm. In both cases, the interest burden should be less than that normal for the type of investment involved, and funds should be more easily available. The deterrent powers of the High Authority would seem to be stronger than its support powers, except in periods when capital is very scarce and very expensive.

The High Authority can raise funds both by imposing a levy on the value of coal and steel output, and by borrowing. The levy came into operation on January 1st, 1953, and is currently set at 0.9 per cent. After covering administrative and other charges, it should provide 41.5 million E.P.U. units of account in 1953-54 for investment purposes. A loan to the Community was approved in principle by the U.S. Government in June, 1953, and detailed negotiations may begin early in 1954. Sums ranging up to $800 million have been mentioned, but American reports put the probable amount at $50 million, or even below. There have also been some reports that Switzerland may be approached for investment funds.

The heavy burden of work involved in setting up the common market left the High Authority with little time to study longer-term problems. No full report on investment policy was produced until January, 1954, and even then it was a report on principles and not a detailed programme of work. Earlier, a survey of the long-term market prospects for coal and steel had been made by a group of economists headed by Professor Tinbergen, and on the basis of their

report, the High Authority has adopted provisional production targets for 1957-58 of 47 to 50 million tons of steel, and 275 to 285 million tons of coal, representing increases of 6 to 8 million tons of steel and of 35 to 45 million tons of coal over the next four or five years. In the case of steel, it is expected that these increases will come from the modernization and rationalization of existing plant, and no extensive new installations are planned. Indeed, there is some fear that, in the case of flat products, capacity is already excessive. The High Authority's plans concentrate rather on removing bottlenecks in the supply of raw materials, especially coking coal and iron ore, which have hitherto prevented the full utilization of existing iron and steel making capacity. The production of coking coal, including grades of coal not previously regarded as suitable for metallurgical coke, is to be increased by 20-22 million tons a year; the capacity of the coking plants is to be increased by 9-10 million tons a year, and changes are to be made to permit the use of the new lower grades of coking coal; and extensive modernization of the ore mines is to raise production from 62 to 80 million tons a year. These developments are to be matched by increased investment in miners' housing, where a target of 40,000 new houses and of 60,000 improved houses has been set.

Maintenance of Free Competition. Two main considerations arise here. Free competition may be impaired both by private agreements and combinations among producers, and by Government action designed to influence arbitrarily the costs of coal and steel producers.

(a) *Producers' cartels and concentrations.* Art. 65 expressly forbids all agreements and concerted practices among producers which might impede competition in the common market, especially agreements to fix prices, to restrict production, to influence investment or technical development, or to allocate markets or sources of supply. The High Authority may authorize certain bodies to continue where the principal purpose of their co-operation is to reduce costs or improve marketing (e.g. an agreement to specialize in the production of certain products), provided that they are not thereby enabled to dominate their market. In general, however, cartels are to be broken up.

The High Authority has acted energetically in this field. Certain iron ore producers' associations, which were price-fixing bodies, have been persuaded to dissolve, and the creation by the High Authority of a central scrap organization has been followed by the naming of certain scrap purchasing and distributing agencies as prohibited bodies.[9] Progress in the coal industry has been slower because of the

[9] E.g., the Schrottvermittlung, Düsseldorf, and the Consorcio Nazionale Approvvigionamenti Matiere Prime Siderugiche, Milan.

genuine complexity of the position, but the Community has already ordered the Oberrheinische Kohlen-Union to eliminate certain practices and agreements with other sales organizations which enabled it to dominate the South German market. A more general review, covering also the steel industry, is now under way. All agreements between producers or distributors had to be submitted to the High Authority by August 31st, 1953, for approval, amendment or rejection, and a slow case-by-case survey is now being conducted.

The Community view distinguishes sharply between 'agreements' and 'concentrations', that is, between cartels and large unitary enterprises. It would roughly be true to say that a cartel is regarded as invalid unless there is some special reason why it should be permitted to exist, whereas a concentration is regarded as acceptable unless there is some special reason why it should be forbidden. All new amalgamations, however, have to be reported to the High Authority, which may issue recommendations designed to prevent abuse of any strong market influence which the concentration might come to exercise. Moreover, if this course proves inadequate, the High Authority can regulate the concentration's prices, conditions of sale, or production and delivery programmes. The major immediate issue in this field is the possible reconstruction of the vertically-integrated Ruhr coal-steel combines, which the High Authority seems inclined to favour.

(b) *State action.* Competition may, of course, be hindered by State, as well as by private, policies, and Art. 67 empowers the High Authority to raise with member Governments 'any action . . . which might have noticeable repercussions on the conditions of competition in the coal and steel industries'. This applies to any case in which normal cost differentials are affected, whether as between the coal or steel industries in different countries, or as between the coal or steel industries and other industries within a country. Under this heading, special State subsidies are forbidden; the High Authority may authorize them in exceptional cases, however, where they are needed to offset either the adverse effects of other State policies or any improvement in wages or working conditions out of line with those occuring in other member countries.

A considerable part of the Convention on Transitional Provisions is linked with this question of permissible public subsidies in the first five years. In the coal industry, a 'perequation fund' is operated by the High Authority. This is financed by a levy on receipts from coal sales in those countries whose average production costs are below the weighted average of costs in the Community, and is designed to

provide assistance to producers in above-average cost countries. The High Authority subsidy must be matched by an equal subsidy from State funds. In practice, this has involved a levy on German and Dutch coal producers and a subsidy to high-cost Belgian mines. French producers, whose costs are roughly about the weighted Community average, have neither borne the levy nor received aid. In the case of Italy, temporary aid has been authorized for the Sulcis mines, now being extensively redeveloped. Moreover, in view of the special position of the Italian coking plants, the Italian Government has been allowed to retain customs duties on coke coming from other parts of the common market, but such duties have to be progressively eliminated over the transitional period. The Italian steel industry has also been allowed special customs protection against other Community countries. The Convention provided that during the first year of the transitional period, maximum duties equal to those fixed at Annecy in 1949 were to be allowed, and that this ceiling was to be reduced by 10 per cent, 25 per cent, 45 per cent, 70 per cent and finally 100 per cent in succeeding years. On the opening of the common market, the Italian Government raised its steel tariff rate from the existing 13 per cent to the full 23 per cent agreed at Annecy, much to the annoyance of other Community members. The reduction of 10 per cent for E.C.S.C. imports made on August 1st, 1953, creates, as it were, a Community Preference rate within the Italian tariff system. Continuation of certain other subsidies has been approved by the High Authority as a temporary measure, such as the French subsidy to coal briquetting plants on the Channel coast and the German subsidy on coal used by domestic consumers and high-sea fishing fleets.

Apart from the Transitional Provisions, the main problem of State influence on competitive conditions to date has arisen out of the considerable differences in the application of indirect or turnover taxes as between member countries. It is not, of course, necessary for the establishment of a common market that the tax burdens be equal over the whole market; the varying incidence of taxation in different parts of the market is part of the basic data which shapes the optimum production pattern. It is, however, essential that in any *one place*, the tax borne by all similar products should be the same, irrespective of place of production. If an imported product bears a heavier tax burden than a home-produced one, trade flows will be distorted. In practice, the Six applied very different systems of turnover taxes and varied greatly in the provision for rebates of turnover taxes on goods sent for export. For example, as a result of the varying charges and exemptions, German billets exported to France received tax

exemptions amounting to 4.7 per cent of the producer's net price, but bore a French 'compensatory tax', (i.e., one designed to 'compensate' for the turnover tax charged on home-produced billets), of 20 per cent. French billets sold in Germany received tax exemptions of 19.6 per cent and bore German compensatory sales taxes of 4 per cent. In German eyes, the French were subsidising steel exports to Germany out of the proceeds of a tax on steel imports from Germany. This problem was examined by a Committee of Experts, headed by Professor Tinbergen and including Mr. Brian Reddaway, and on the basis of its report, the High Authority forbade sellers to include in their price to the final buyer any taxes or dues for which exemption or refund could be claimed. A further examination of the whole question of exemptions and compensations for exports is being carried out in conjunction with member Governments, and a major revision of the several systems may be recommended in 1954.[10]

Commercial Policy. The Community represents a new type of international trading unit. It involves an economic union for a number of products, instead of for a number of countries, and it operates within a geographical area which remains split between economically-sovereign states. Two points in particular — the division of power in the field of commercial policy between the member States and the Community; and the relations between the Community and the trading world — have raised interesting problems.

All customs barriers within the common market have, of course, been abolished for coal and steel (except for temporary Italian arrangements). The removal of fences *within* the common market, however, raises in an acute form the problem of who is to control the height of the fences *around* the common market. It is clearly useless for country A to impose a high rate of duty on a certain product, if that product can enter cheaply into country B, and then move across the free border into A. Once internal tariff barriers are down, the interdependence of the member States in the whole field of tariff policy becomes obvious.

The Treaty is somewhat hesitant at this point. It provides only that maximum and minimum rates of duty on coal and steel imports from third countries may be fixed by the Council of Ministers; but this decision requires a unanimous vote, and the right to set actual separate tariffs within these limits remains with each member country. The Treaty also empowers the High Authority to supervise any

[10] Two further ways in which State action may affect competitive conditions are through social security systems and through general wage-reducing subsidies (e.g., on food or housing). These are discussed later under 'Labour'.

national import and export licensing systems for coal and steel in order to prevent such systems from becoming unduly restrictive. Further, it may recommend counter-action (including quantitative restrictions under certain conditions), in face of heavy imports from a third country which are seriously disturbing Community production or which are made possible by low wage rates or unfair trading practices. The Convention on Transitional Provisions, however, remedies these failings. It clearly accepts the inevitability of a harmonization of tariff policies, and looks forward to 'a lowering of customs duties on steel in the direction of a harmonization with the least protective tariffs practised in the Community'. The fences around the common market are to be trimmed down until they are everywhere equal.

Prior to the opening of the common market, Benelux had the lowest import duties on steel in the Community, with France coming next, followed by W. Germany, and finally Italy. If this situation had been allowed to continue, British steel might have been sent into Benelux at low rates of duty and distributed from there throughout the customs-free common market area, thus negativing the French, German and Italian protective tariffs. Under Section 15 of the Convention on Transtitional Provisions, therefore, the Benelux countries agreed to apply their low rates of duty only to imports up to their previous quotas, that is, to imports which could reasonably be supposed to be for home use. All imports in excess of the former quotas would be charged at a rate equal to the next lowest rate applied by a Community country. France and Germany have harmonized their steel tariffs at the French level of 14-18 per cent as a prelude to a general reduction, and a further temporary reduction to 6-8 per cent has been made in the German tariff, subject to a 'home tariff quota' similar to that applied by Benelux.[11] These tariff quotas may be maintained until either the conclusion of tariff negotiations with Britain or the end of the five-year transitional period, whichever comes first. The Community hopes, by the end of the transitional period, to have established a single harmonized tariff rate in all member countries. Moveover — a point of importance to outside countries — this single rate is to be achieved by 'levelling-down' rather than 'levelling-up'. The new rate is not to exceed the lowest rate then prevailing in the Community, although the low Benelux rate may be raised by up to two points for this purpose.

Since the Community represents a new type of international trading unit, not fitting easily into any of the existing categories, it has

[11] The special concessions with regard to the Italian duty on steel from Community countries during the transitional period are described on page 102 above.

had to negotiate a special basis of relationship with international trade bodies. G.A.T.T. and O.E.E.C. were particularly affected. In the absence of a waiver of the Most Favoured Nation clause in G.A.T.T. and of the O.E.E.C. clause on non-discrimation in trade liberalization, all concessions made within the common market on customs duties, abolition of quotas, etc., would automatically have had to be extended to non-Community States. The contracting parties to G.A.T.T. agreed in November, 1952, that in all matters affecting coal and steel, the six member countries can reasonably be regarded as forming one trading unit. The waiver of the M.F.N. clause was, therefore, approved. On coal and steel questions, the Six will henceforth be treated as one single Contracting Party, and in return, the High Authority has accepted the responsibilities involved in that status. As regards O.E.E.C., no negotiations were involved; the member countries simply had to notify the Organization of their intention to create a special customs regime within the terms of the Code on Liberalization of Trade.

Foreign Trade. One major problem which has arisen in recent months concerns the extent of the Community's authority over sales by Community producers *outside* the common market. Here, the Treaty is somewhat vague. Art. 3(f) requires the High Authority to 'see that equitable limits are observed in prices charged to external markets', and Art. 61(c) empowers it to fix maximum and minimum export prices in certain vaguely defined circumstances. In general, however, the balance of power between the Community and the member States in the export field is left uncertain, possibly deliberately so.

In face of the weakening world market for steel at the beginning of 1953, French, Belgian, Luxembourg and German steel exporters agreed in Paris in March, 1953, to maintain export prices at not less than Community home market prices. This purely verbal 'Paris Entente' was confirmed by the more formal Brussels Price Convention in May. During the summer, the market continued to sag, and at a meeting in Luxembourg in September, the exporters eased the minimum prices for the weakest products and markets, and sought to hold this line by strengthening the Cartel. A contractual agreement — the International Steel Price Convention — was signed, providing for fines averaging $50 a ton in cases of undercutting, for a Standing Committee to supervise the working of the agreement, and for a common fund. Despite these arrangements, however, undercutting by Cartel members still continued, and even though a meeting at The Hague in November acquiesced in more substantial cuts in minimum prices, actual export offers by Schuman producers

were some 5 to 10 per cent below the official minima by December.[18]

The High Authority decided that the original Paris Entente did not warrant its intervention, but its attitude from the first was one of scarcely veiled disapproval. The strengthening of the Cartel in September, 1953, however, led the High Authority to consider counter-action, especially as pressure to this end began to be applied by the U.S.A. and some member countries of G.A.T.T. In mid-November, the High Authority requested the Cartel to dissolve, threatening that, 'Otherwise, we would have to consider the means which the Treaty gives us to put an end to them.' When the Cartel proved unresponsive, the High Authority decided tentatively to introduce its own official minimum prices in the export field. Both the Consultative Committee and the Council of Ministers refused, however, to support such a move, and the High Authority has tacitly dropped the issue for the present.

Transport. The principle of non-discrimination which underlies the pricing concepts of the Treaty is applied to transport charges as well as to coal and steel prices. If there is to be a real common market, transport rates must be such as will allow consumers to make true comparisons between competing producers. Discriminatory freight rates prevent such comparisons and thus distort the proper locational pattern of the industry. In view of Continental distances, the freight element in the delivered price of steel is often considerable,[19] particularly since some 10-20 per cent of the ex-mill price itself is due to raw materials transport charge, quite apart from the transport cost of the finished product. The damage which can be done by discrimination in freight rates is, therefore, correspondingly heavy.

Prior to the opening of the common market, each of the six national railway systems had developed a rate structure designed to assist its own country's producers and to hamper foreign competition. Table 4 illustrates the French railway's discrimination in favour of home users of Lorraine ore, and Table 5 illustrates German discrimination in favour of home users of Ruhr coking coals.

In the terms of Art. 70, non-discrimination involves the application to traffic coming from, or destined for, another country of the rates charged for internal traffic of the same type over the same, or a similar, route. Three types of discrimination are noted for remedial action by the Treaty and the Convention.

[18] The Cartel price for merchant bars (round and square, ¼in. to 2¾ in., f.o.b. Antwerp, Thomas quality), was $87 in March, 1953, and had fallen to between $80 and $86, according to markets, by November. Actual offers, however, were regularly being made at $78 in December.

[19] In the case of coal, Gelsenkirchen coal selling in Munich at 81.50 DM. a ton included a freight charge of 28.50 DM., or 35 per cent of the delivered price.

TABLE 4

FREIGHT CHARGES: LORRAINE ORE (PER TON)

Route	*Distance (Km)*	*Cost* *B. frs.*	*F. frs.*
Saney—frontier (Ecouviez)	47		388
Frontier—Marihaye	164	73	= 522
Total, Saney—Marihaye (cross-frontier)	211		910
Saney—Azincourt (Internal)	284		631

TABLE 5

FREIGHT CHARGES: RUHR COKING COAL (PER TON)

Route	*Distance (Km)*	*Cost* *DM*	*F. frs.*
Gelsenkirchen—frontier (Nennig Fre)	302	20.30	= 1727
Frontier—Homécourt	61		735
Total, Gelsenkirchen—Homécourt (cross-frontier)	363		2462
Gelsenkirchen—Rosenberghütte (internal)	562	21.30	= 1813

The first of these is the direct failure to apply internal rates to international traffic. As was required by the Convention, most of these cases were removed within three months of the opening of the common market, and the resulting savings, which have been estimated at over £1 million in a full year, represent one of the major achievements of the Community. For example, the German rates for internal traffic ex German mines were applied also to Saar-Lorraine coal, reducing freight charges from Reden to Regensburg by 16 per cent. Similarly, the French rates for internal and foreign shipments of Lorraine ore were harmonized at slightly above the previous lowest rates, increasing freight charges on the internal route Saney-Azincourt by 4 per cent, but reducing the charges on the international route Saney-Ougrée by 8 per cent. Again, Belgian rates for steel designed for export through Antwerp, which had previously been much higher for Saar and French producers than for Belgian and Luxembourg producers, were harmonized at an intermediate rate. The striking result in the case of three adjacent, but nationally distinct, producing centres is shown in Table 6: for much the same distances, freights varied by 72 per cent before the opening of the common market, but only by 32 per cent afterwards.

The second type of discrimination arises out of the 'interruption of charges'. Even if national railway systems charge international

TABLE 6

ROLLED STEEL FOR EXPORT THROUGH ANTWERP: BELGIAN RAIL CHARGES

Route	*Origin*	*Distance (Km.)*	*Price per ton (B. frs)*		*Difference*	
			Old	*New*	*B. frs.*	*Percentage*
Arthus—Antwerp	Belgium	245	184	222	+38	+21
Rodange—Antwerp	Luxembourg	257	230	268	+38	+16
Mont St. Martin—Antwerp	France	260	317	293	−24	− 8

traffic at internal rates, the average cost per ton mile is likely to be higher for cross-frontier traffic since most rate structures apply rates decreasing with the length of the haul, calculated either from the point of entrainment or from the frontier. Thus international traffic is denied the full advantages of degressive rate-for-distance systems: this is the explanation of the remaining 32 per cent gap between charges left after the revision of rates in Table 6. The creation of direct through rates has to be completed within two years and is currently under review.

Thirdly, even if the actual rate structures are applied impartially to internal and international traffic, discrimination may still arise because the *principles* underlying each national rate structure will have been chosen because they suited the particular needs of the country's own producers, and they may well prove disadvantageous to producers from other countries. Clearly, this raises extremely complex problems, but the several rate systems are now being examined with a view to gradually developing one common set of rating principles for the whole Community.[14]

Extreme care must be taken in examining accusations about freight discrimination prior to the opening of the common market and claims regarding subsequent improvements. For example, Table 7 sets out two cases of German rail charges in 1951.

TABLE 7

GERMAN RAIL TARIFFS: IRON ORE SHIPMENTS

Origin	*Route*	*Distance (Km.)*	*Tariff*	*Cost per ton*	*Cost per ton/Km*
Lorraine	Igel (frontier)—Dortmund	285	7.G.1	6.60 DM	2.3 D.pfg.
Sweden	Bremen—Dortmund	224	AT.75.2	2.89 DM	1.29 D.pfg.

[14] Reviews are also being made of traffic subject to contract rates rather than published schedules, and of special rate schedules.

At first sight, this appears to be — and has been claimed to be — a blatant case of discrimination on national grounds, the per ton/Km. rate charged on Lorraine ore being almost double that charged on Swedish ore. But the effect of competition from alternative forms of transport along these routes must be carefully considered. In the case of Lorraine ore, movement by rail along the Igel-Ruhr line is the only practicable mode of transport. In the case of Swedish ore, however, the Dortmund works could take supplies by water-borne transport through Antwerp or Rotterdam and then up the Rhine, while the competitive rates on the Dortmund-Ems Canal would also be available. Notwithstanding these cautions, however, the impact of the Community on transport discrimination seems to have been both considerable and desirable.

Labour. Art. 3(e) requires the Community, 'to promote the improvement of the living and working conditions of the labour force . . . so as to make possible the equalization of such conditions in an upward direction'. In general, however, the Community seeks to do this indirectly, as a by-product of its general expansionist economic programme, rather than by direct action in the labour field.

The possibilities of direct action by the High Authority are, in any case, limited by the Treaty. Art. 68 clearly lays down that responsibility for fixing wages and social payments remains within the member States. The High Authority can intervene on wage issues in only two cases: (i) where firms faced with the need for 'permanent economic adjustment' seek relief in wage cutting instead of seeking to improve general efficiency; and (ii) where a firm is quoting abnormally low prices which are based on the payment to its workers of wages lower than the general level of wages in its region. The High Authority cannot intervene if a general wage reduction is made as part of a country's attempt to restore its balance of payments position, nor if such a reduction is made because of a general fall in the cost of living or to correct abnormal increases previously awarded in exceptional circumstances. Neither can the High Authority intervene in cases where the general wage level in one region as a whole is lower than that in other regions. In general, the Treaty seeks 'to take wages out of competition' within regions, but accepts the existence of differing wage levels between regions as a factor in shaping the production pattern, while hoping that such regional differences will gradually be removed.

Action on wage issues has so far been limited to the collection of comparative data on wage levels, condition of work, systems of payment, and similar matters. The provision of such statistics, however,

though neutral in itself, may well generate forces which will tend to 'level up' wages in the member countries. The 'force of comparison', which is already a compelling criterion in wage determination within national labour markets, will become increasingly potent a factor within the wider bargaining area of the common market as knowledge of comparative wages and conditions becomes more widely spread. This tendency will be speeded up by the increasing contact between national trade union leaders arising out of the work of the Community.[18]

Apart from wages, the other three labour questions taken up by the High Authority have been occupational training, the mobility of labour, and the provision of workers' houses. On none of these issues, however, has any real action been taken. Discussions on migration have become bogged-down because of the unions' fears of immigrant labour. On housing, the High Authority has spoken of an investment programme sufficient to improve 60,000 old houses and to build 40,000 new ones: in practice, however, the High Authority has yet to decide the financial and technical methods to be employed, let alone build a house.

To date, the High Authority has had no occasion to use its most positive powers in the labour field. The drafters of the Treaty were aware that the impact of an expanionist policy on hitherto carefully coddled firms might cause considerable social distress. Art. 56, therefore, gives the High Authority wide powers to safeguard the position of workers displaced as a direct result of the opening of the common market or by technological advances in the coal and steel industries. In the case of redundancy, it may pay doles to the workers affected as a temporary relief. For a more permanent solution it can pay the men retraining grants and arrange for them to be taught new skills, or it may provide movement grants to encourage transfer to undermanned areas. Alternatively, it can seek to create new jobs for those made redundant by financing new projects, not only in the coal and steel industries, but also in other lines of business. These powers may be tested in the near future. The High Authority has argued that the

[18] The Trade Unions, with the exception of the Communists, have supported the Community and are represented on its institutions. In an individual capacity, Herr Potthoff (previously a leader of the German Trade Unions) and M. Finet (ex-President, I.C.F.T.U.) are members of the High Authority, and Herr Serrarens (ex-General Secretary, International Confederation of Christian Trade Unions) is a judge of the Court of Justice. The Trade Unions are directly represented on the Consultative Committee, and share the 17 workers' seats on an agreed basis. Both the Socialist and the Christian groups have set up Liaison Offices in Luxembourg.

The unions have been pressing the High Authority to take a much more positive line on social policy, and to intervene actively to level-up wage levels. In face of Communist opposition to the Community among the miners and steel-workers, they claim that immediate concrete gains are necessary if the support of their members is to be held.

recent unemployment in certain French and Belgian coal-fields has been caused by the general economic decline in those countries, rather than by the opening of the common market as such, and that the 're-adaptation' provisions do not therefore apply. When the John Cockerill Company recently announced the closing of seven uneconomic pits in the Borinage area of Belgium and the dismissal of 6,000 workers, however, it called on the High Authority for aid in re-adaptation, and this may well develop into a test case.[16]

Two matters arise in the labour field which have very wide implications as regards British social policies and British association with the Community. Firstly, it is argued that our method of financing social security benefits gives our coal and steel industries an unfair cost advantage *vis-à-vis* Community producers. With considerable qualifications in detail, it is broadly true to say that each Community industry finances the social benefits of its workers by charges borne directly by the industry and which are thus reflected in costs. Britain, on the other hand, finances her system very largely out of national taxation, with direct insurance contributions by employers and workers playing a comparatively unimportant part: the social element in labour costs is therefore low, and so British coal and steel are given a competitive advantage. The complainants usually stop at this point, but for any true comparison to be made the analysis must clearly be carried further. The costs of the social benefits provided in Britain must be borne *somewhere*, and inevitably, sooner or later, directly or indirectly, they are passed back on to industry: the much greater reliance on taxes on profits in British, as against Continental, tax systems is clearly relevant here. Certainly, however, the differences in this field are so great as to create a formidable obstacle to the working out of any unified pricing system for Britain and the Community, as Table 8 shows.

TABLE 8

LABOUR CHARGES: U.K. AND E.C.S.C. STEEL INDUSTRIES, MONEY WAGES AND SOCIAL CHARGES. (A POST-WAR YEAR)

	U.K.	*Germany*	*France*	*Belgium*
	s. d.	s. d.	s. d.	s. d.
Money Wages per hour	3 8	3 2	2 8	4 1
Social charges per hour	3	10	2 1	1 8
Total	3 11	4 0	4 9	5 9

The second complaint goes wider. It is argued that British food and housing subsidies have been used to keep down living costs in

[16] The decision to close these pits has been temporarily suspended.

order to restrain money wage increases: therefore they represent a form of State intervention to keep costs on an artificially-low level, and as such would be forbidden under the Treaty. British steel prices are below Schuman prices, it is claimed, not because of real differences in costs, but because part of British costs are borne elsewhere, by Government subsidies to provide cheap food, cheap housing, cheap transport, cheap coal, and so on. That subsidies have distorted our economy and concealed true costs would be widely admitted in Britain, and public policy has gone far towards their removal. It is certainly exaggerated, however, to attribute to this factor alone the price differential between British and Community producers, especially in the case of the steel industry where heavy fixed charges minimize the influence of labour costs on selling prices.

CONCLUSIONS

1953 was the first full year during which the High Authority exercised the powers granted to it under the Schuman Treaty. What conclusions can we reach after reviewing the year's work?

Clearly, the first conclusion is that it is, as yet, much too early to form any strong view, either for or against. We are much too close to events, and too little able to pick out the permanent from the transitory, to pronounce definitely one way or the other. All the judgements which follow hold only within this broad qualification and are purely tentative.

General. The most impressive achievement of the Community is that it represents the first considerable check to the autarkic trend which has dominated the European economy since 1918. For the first time in thirty-five years, the barriers are being substantially reduced. Over the major part of continental Western Europe, customs duties and quantitative restrictions on the free movement of coal and steel have been abolished, currency has been made freely available for these imports and exports, discriminatory transport charges have been very largely eliminated, and some limitation of 'dual pricing' has been secured. In all, that forms an appreciable victory for the cause of economic rationality.

Production. In terms of production, the picture is not favourable. The output of coal in the six countries fell from 240.4 million tons in 1952 to 236.9 million tons in 1953, or by 1.4 per cent; steel output fell from 41.8 million tons to 39.5 million tons, or by 5½ per cent, over the same period. This fall is all the more noticeable since it represents the first check to the upward curve of West European coal and steel output since 1945. In large measure, these declines reflect the general falling off in economic activity in the Community area, but it would

seem that the upheavals connected with the opening of the common market exacerbated the downward trend. In the case of steel, buyers held off the market for some months both before and after May 1st in the hope of benefiting from the price reductions forecast by the more enthusiastic supporters of Schumania. Consumers ran down stocks throughout the spring and summer, encouraged by the evidence of shortening delivery dates, and buying did not resume until autumn by which time stocks were low and the expected price adjustments had come about, albeit unofficially.

Inter-Community Trade. The results for inter-Community trade in coal and steel are encouraging in view of the fall in total production. It is probable that the general fall in demand forced Community producers to explore the new possibilities offered by the common market rather more quickly than they would have had their home demand remained high, but some aspects of the increased trade within the Community — e.g., the flow of French iron ore to Belgium, and sales of Dutch coal throughout the Community — clearly spring from the removal of artificial barriers within the common market. The position for individual products is as follows.

(i) *Steel*

TABLE 9

INTER-COMMUNITY SALES OF STEEL

Period	*Monthly Averages*	1952	*1st Qtr.* 1953	*2nd Qtr.* 1953	*3rd Qtr* 1953	*October,* 1953
Amount	'000 tons	237	282	261	232	287

There was a sharp fall in activity between May and September, 1953, but the inter-Community trade over the first ten months of 1953 is slightly above the level for the corresponding period of 1952. It is probable that, but for the existence of the Community, the member countries would have adopted restrictive policies in face of the decline in demand and cross-frontier trade would have been much lower. The ending of transport discrimination on German railways has been followed by a sharp increase in sales from Lorraine and Saar mills in Western Germany: these sales totalled 150,000 tons in September-November, 1953, as against 200,000 tons for the whole of 1952.

(ii) *Iron Ore.* In 1952, inter-Community deliveries averaged 1,100,000 tons a month, and this figure was regained from March to July, 1953, after a decline to 959,000 tons a month in January-February, 1953. The main trade affected is the sale of French ore to

Belgium which has increased by 20 per cent following on the abolition of French quota limitations.

(iii) *Scrap*. During the first ten months of 1953, inter-Community deliveries amounted to 600,000 tons as against 360,000 tons in the corresponding months of 1952, an increase of some two-thirds. This, however, represents not so much an increase in availabilities and usage, as the diversion to Italy of scrap released by the fall in demand from German steelworks.

(iv) *Coal*.

TABLE 10

INTER-COMMUNITY TRADE IN COAL. 1ST 11 MONTHS, 1952, 1953. '000 TONS

Country of Origin	*W. Germany*		*France*		*Belgium*	
Country of Destination	1952	1953	1952	1953	1952	1953
W. Germany	—	—	3309	3542	17	102
France	3101	3174	—	—	904	1277
Belgo-Luxembourg	350	601	264	216	46*	11*
Holland	1615	1884	4	84	435	753
Italy	2486	2801	157	421	495	710
Totals	7552	8460	3734	4263	1897	2853

Note: *Luxembourg only.

The Table shows substantial increases in almost all instances. The increase of one-third in Belgian sales is especially noticeable. Total inter-Community deliveries in January-November, 1953, rose by about 3 million tons (20 per cent), as compared with the same months in 1952, and this has made possible a reduction in imports of American coal from 16.4 million tons to 6 million tons in these same two periods.

Pricing Policy. It is in this field that the Community has been least successful. The pricing system instituted for steel has proved to be cumbersome and paper-ridden, and has been substantially ignored by producers and consumers. Secret undercutting of the firms' published price lists has been widespread and the High Authority has failed to secure observance of its non-discrimination principles.

These difficulties have been tacitly acknowledged by the issue of new pricing rules on January 13th. These allow firms to adjust their prices to day-to-day market fluctuations without amending their published price lists. But the variation for each product group between the average realized price and the average published price over a 60 day period may not exceed 2½ per cent of the published basis price, and discrimination between comparable transactions is still expressly forbidden. It is clearly the intention of the High

Authority to do no more than to introduce a small margin of flexibility into the previously over-rigid pricing arrangements.

But good intentions may be abused. Under the previous pricing system, abuse was easy to define. It meant simply departing from the published price list. Under the new system, however, a producer's prices are expressly permitted to vary according to market conditions. Moreover, no limit is imposed on the amount of any particular deviation from the published price: the 2½ per cent limitation is applied only to the average deviation over a 60 day period. Thus the detection of discrimination becomes a matter of collecting elaborate records of transactions, and then of applying personal judgements, rather than precise rules, to the facts revealed. In order to operate the new system, the High Authority has had to call for fortnightly returns of transactions from all producers, showing not only the average divergence from the published price, but also the maximum and minimum divergence, including details of the order, the tonnage, the country of domicile of the client, and so on. How far, how very far, is all of this from a free market system. Whatever the intentions of the High Authority, the new regulations seem at very least to open up possibilities of discrimination, contrary to the express purpose of the Treaty: and if those loop-holes are to be plugged, the High Authority will have to operate an extensive system of returns, spot-checks, inspectors, and the rest, equally contrary to the express spirit of the Treaty. Time alone will tell whether the High Authority has introduced a little flexibility into its pricing system or opened the way to its destruction.

The 'alignment' provisions have worked particularly badly. Producers have utilized these concessions in order to invade other firms' spheres of influence only very rarely, and the desired shift of orders to low cost producers has not, therefore, come about. Indeed, the alignment rules have been used — or rather, abused — mainly by consumers who, by threatening to transfer to other firms who might possibly be induced to make an aligned offer, have been able to force price concessions from their regular suppliers.

Investment. Progress in the development of investment policies has been slow. The Community has been concerned mainly to build up its credit-worthiness, on the basis of its income from the levy on producers, and little concrete action has been taken. Once actual allocations of funds begin, great tensions may arise between member States. Everyone involved is acutely aware of the political issues involved. If the High Authority is able to insist that finance should be allocated on purely economic grounds, so as to concentrate production in the most efficient mines and works irrespective of their

nationality, the supra-national nature of the Community will be strikingly confirmed. If, on the other hand, substantial concessions have to be made to purely national claims, the Community will have stumbled at its first fence. The High Authority, in its report of January, 1954, has stated that it, 'does not aim to allocate its financial assistance *a priori* according to a rigid plan or a detailed programme, *even less on a national basis*'. (My italics.) Yet already even moderate French and German spokesmen have been putting forward exaggerated investment projects so as to establish bargaining positions, while the outright opponents of the Community see in rumours such as, 'all investment funds will go to the Ruhr', a fruitful opening for an appeal to national fears. It will be interesting to see if the High Authority can maintain a balance between the economic and the political viability of its investment programme.

Foreign Trade. On the control of the Community's foreign trade, the first issue on which the High Authority's power has been challenged, it has suffered a clear defeat. Though the battle may well be joined again later, the first round has undoubtedly gone to the European Steel Export Cartel. This defeat may well have important internal repercussions. The fact that some producers have been prepared to fight the High Authority and have succeeded in their defiance cannot fail to influence others. The High Authority would seem to have been extremely ill-advised to lay itself open to such a blow to its prestige on an issue which was not of the first moment and on which its constitutional power was ill-defined.

Summary. The general conclusions are patchy. After a few initial months in which all seemed to be going well, the Community has run into a period of stress and strain, which may severely test its cohesion. Total production of coal and steel for 1953 has fallen as compared with the previous year, the first year-to-year fall since 1945; stocks of coal in France and Belgium have risen to 9 million tons; Ruhr coke stocks have risen to 3.1 million tons and daily output has been cut back by nearly a quarter; and many steel plants are working at 80 per cent of capacity, or less. Against this background, the High Authority has substantially lost control of the price situation, and has had to modify its pricing structure: moreover, it has also publicly failed in its attempt to extend its control to cover the export field. But it would be wrong to ignore the underlying strength of the Community. The common market has been created and there is little chance that it will be broken up again. The Community exists and will continue in being, and increasingly producers and consumers will have to adapt their policies and their outlooks to fit into this new pattern. It is almost certain that some of the Community's

economic policies will have to be considerably altered. It may well be that the balance of influence as between the High Authority and the Council of Ministers will shift in favour of the latter. It may even be that some 'fundamental principles' of the Treaty will need to be revised in the light of experience when revision becomes possible five years hence. But though such amendments may be called for, and though failure to implement the E.D.C. and E.P.C. projects may leave E.C.S.C. dangerously isolated, the common market has come to stay. That is the new dynamic factor which will shape the economy of Western Europe in the decade ahead.

LONDON

ORGANIZATION AND EFFICIENCY OF THE HOUSE-BUILDING INDUSTRY IN ENGLAND AND WALES[1]

by P. A. Stone and W. J. Reiners

SUMMARY

This paper contains a brief review of the organization and efficiency of traditional house-building in England and Wales. Some account is given of the firms mainly concerned in this class of work and of the way the work is organized between different types of firms. The large variations in labour expenditure and their probable causes are discussed. Indications are given of the differences of productivity associated with different types of supervision and incentive schemes, and as between main and sub-contractors; some measure is also given of the differences associated with differences in experience, size of contract, region and so on. The savings possible nationally by even limited improvements in productivity are shown to be substantial; important savings could also be achieved by reductions in the building time, which is an important factor in determining the size of the overheads.

INTRODUCTION

The object of this paper is to give an account of the organization and efficiency achieved in traditional house-building in England and Wales. For this purpose the main information has been obtained from two studies of productivity in house-building[2] which were based on sample surveys. While the picture that emerges is by no means complete, it does provide a more detailed analysis of certain aspects of organization and efficiency than is available for most other industries.

THE HOUSE-BUILDING INDUSTRY

There are about 300,000 building operatives now engaged in house-building; they generate about one and a half per cent of the gross national product. About 280,000 dwellings were built in England and Wales in 1953, over a fifth of which were built under licence for private individuals. About 90 per cent of this work is carried out by contractors, 7 per cent by local authority direct labour organizations, and most of the balance by public utility undertakings whose work is mainly confined to the installation of utility services, gas, electricity and water. Firms classified as 'general'

[1] Crown Copyright Reserved.
[2] National Building Studies, Special Reports Nos. 18 and 21.

contractors carry out about four-fifths of the house-building done by contractors, 'trade' or specialist contractors carrying out the balance.

In England and Wales contracts for building work are made between the building owner, and a 'main' contractor, who contracts to supply and control all the labour and materials involved in carrying out the work to completion. The contractor does not usually carry out the whole of the work with his own directly employed labour, but may sub-contract at least some of the trades such as plastering, plumbing, painting, and the utility services. Sometimes the architect concerned will nominate the particular sub-contractors to carry out work such as floor-laying and central heating. The main contractor may in some cases sub-let the work in most of the trades and confine his own activities to the organization of the whole of the work of the contract.

Local authority direct labour organizations can be considered, in effect, as main contractors. Though they may sub-contract one or more of the finishing trades to private sub-contractors, on the whole they sub-contract less than most contractors. This applies particularly to the organizations built up in the south since the war.

Firms of the building and civil engineering industry range in size from those consisting of one or several self-employed operatives to firms employing upwards of 5000 operatives. Only about a quarter of the work carried out in the industry is in house-building; most firms being engaged in a diversity of building and civil engineering activities. Two-fifths of the firms employ no operatives, being merely self-employed men; a further two-fifths employ no more than five operatives; only one per cent of the firms employ as many as 100 operatives, although collectively they employ about two-fifths of the operatives in the industry. The really large firms are mainly general builders, and building and civil engineering contractors. Few trade or specialist contractors employ more than 500 operatives.

While the volume of house-building work undertaken by the smallest firms is small, as much as two-fifths is carried out by firms who normally employ no more than 30 operatives. About one-fifth of the work is handled by firms with 500 or more operatives. Two-thirds of house-building is undertaken by firms whose major activity is house-building.

MATERIALS, LABOUR AND ONCOSTS

Materials account for something over a half of the final costs of house-building, labour for less than a third, and overheads and profits for the balance.

The prices of building materials and building components are

not within the control of the contractor except where building operations are on a scale sufficiently large for savings to be made by bulk purchase, but such savings are partly off-set by the costs of storage, additional handling and credit. Further savings are possible by eliminating wastage and by economical design.

Labour costs are, to a large extent, within the control of the building firm. The hourly rate for labour is, of course, determined nationally by agreement between the two sides of the industry but its level of productivity depends to a large extent on the organizational efficiency of the firm. The wide variation of output existing between different firms and the factors connected with this variation are discussed later in the paper.

Overheads in house-building are probably rather lower than in the building and civil engineering industry as a whole, but the familiar industrial pattern is followed, namely a fall in percentage overheads from small to medium firms and a rise from medium to large firms. But overheads, expressed as a percentage of costs, are not a true guide to comparative efficiencies. Their absolute amount depends not only on administrative efficiencies but also on the nature of the services provided and, in so far as such services are effective in reducing prime costs, they will increase the percentage of overheads.

LABOUR EXPENDITURE

Labour expenditure is normally considered as the total manhours spent by operatives actually engaged in the erection of dwellings, and excludes such unavoidable non-productive time as travelling time, and time lost as a result of bad weather. It is, therefore, the gross productive time and is dependent directly on the quality of the contractor's organization and supervision, and on the efficiency of his operatives.

The range of total labour expenditure per house for similar work is considerable, both for main contractors and for sub-contractors. This is also the case for the individual trades, even if the exceptional contracts are excluded. This can be seen from Table 1, which shows the labour expenditure for individual trades as shown by a survey of Productivity in House-Building.[1]

The average labour expenditure needed to construct a dwelling and its ancillaries was about 2700 manhours.

The figures in the Table indicate the substantial size of the savings in the labour expenditure that could be obtained were the less

[1] National Building Studies Special Report No. 21. Figures of labour expenditure and costs given in this paper are based on a random sample of 177 contracts for dwellings built for local authorities over the period 1948-1950 and are representative of about 60 per cent of traditional house-building in England and Wales.

TABLE 1

RANGE OF LABOUR EXPENDITURE IN MANHOURS ENCLOSING TWO-THIRDS* OF THE CONTRACTS
MANHOURS PER DWELLING

Trade	*Main Contractor*		*Sub-contractor*	
	Upper Limit	*Lower Limit*	*Upper Limit*	*Lower Limit*
Site Works† (General and Bricklayers' Labourers)	1115	687	—	—
Bricklaying (skilled)	826	416	—	—
Carpentry and Joinery	513	271	325	210
Plastering	394	210	289	178
Plumbing	234	107	182	90
Roof Tiling	—	—	70	38
Painting	287	156	197	108
Glazing	—	—	15	7
Electrical Work	—	—	80	33
Gas Fitting	—	—	28	10

* One sixth of the contracts had a labour expenditure above the 'Upper Limit' and one-sixth below the 'Lower Limit'.

† Work includes excavating, concreting, handling and unloading, and general servicing.

efficient builders able to achieve the results of the most efficient, or even of the average, builders. The results of a survey can only be descriptive, they cannot provide any proof that any one condition will raise productivity as compared with another but they do provide some indication as to the conditions under which high levels of productivity can be achieved. In the following sections the variation of labour expenditure is considered in relation to the various factors likely to affect it. As far as possible the influence of all conditions, other than that under consideration, has been eliminated by usual statistical methods.

The range of labour expenditure for similar work, on the house as a whole, carried out by the main contractors is less than for the separate trades, though still substantial; for the middle two-thirds of the contracts the range is 40 per cent of the average. There was a tendency for different trades carried out by the main contractor's labour on the same contract to have a similar level of performance and also some indication that contractors are consistent from contract to contract; the variation between contracts completed by the same firm was markedly less than between different firms. Thus it would appear that site conditions are not an important source of variation but that the variations arise between, rather than within, firms. It is therefore important to examine how differences in the organization of firms are associated with differences in labour expenditure.

Sub-contracting. As explained earlier, sub-contracting is of considerable importance. (See Table 2). The work of certain specialized

trades, such as proprietary floor finishing, is almost invariably sub-contracted, the work being carried out, usually, by the firm manufacturing the material. The sub-contractor for such work is often nominated by the architect.

The trades of glazing, gas fitting and electrical work are almost invariably sub-contracted and, in the majority of cases, roof tiling also is sub-let. The amount of work involved in any of these trades is not sufficient, at least for the smaller firms, to justify retaining the specialist craftsman. While glazing can be, and, particularly in certain areas, is carried out by painters and plumbers, roof tiling by bricklayers, and gas fitting by plumbers, contractors often prefer to sub-contract such work to specialists, who are themselves the suppliers of the materials and who, in consequence, accept the responsibility for breakages and for damage arising from faulty work. Gas fitting is usually carried out by the Gas Boards, and electrical work by electrical contractors or the Electricity Boards. Some local authority direct labour organizations do the electrical work with their own labour — a continuation of the policy followed in the days when they were the local electricity authority. The Gas and Electricity Boards are always responsible for the service pipe or cables, and the connection to the meters. On about half the contracts studied in the survey, plastering, plumbing and painting were sub-contracted.

The major trades of bricklaying and carpentry are rarely sub-contracted. This applies also to the work normally carried out by the general labourers, such as excavation, concreting, site clearance, unloading and handling generally. With the exception of unloading and handling, there would appear to be no special difficulty in contracting separately the work dealt with by these trades and this is, in fact, generally the practice in Scotland. In England and Wales, the sub-letting of such trades is largely confined to the London area, usually on a 'labour only' basis.

Labour expenditure for similar work was, on average, greater when the work was carried out by main contractors than when dealt with by sub-contractors. The only trades for which this comparison could be reliably made, owing to the limited amount of data available, were plastering, plumbing and painting, but the figures for the other trades give similar indications. These results indicate that, whereas the labour expenditure of some main contractors was no more, and in some cases even less, than that of some sub-contractors, the sub-contractor on average carried out similar work with 15 to 20 per cent fewer manhours than the main contractor. No comparable information could be obtained for either a costs or a price comparison. It

TABLE 2

ESTIMATES OF THE EXTENT OF SUB-CONTRACTING IN HOUSE-BUILDING IN ENGLAND AND WALES
Percentage of contracts for which the trade was sub-contracted

Trade	*Region*				
	Northern E. and W. Ridings North Western	*North Midlands Wales Midlands*	*Eastern Southern South Western South Eastern*	*London*	*England and Wales*
Site Works (General and Bricklayers' Labourers)	5	12	7	35	10
Bricklaying	2	6	11	42	10
Carpentry and Joinery	8	4	14	32	12
Plastering	50	70	70	93	66
Plumbing	44	72	54	82	57
Painting	52	46	21	58	42
Roof Tiling	75	91	96	99	88
Electrical Work	90	98	95	100	95

may be possible for main contractors to reduce their labour expenditure by adapting the special features of the organization of the sub-contractors to their own uses.

Firms accepting sub-contracts range in size from small groups of self-employed operatives to regional and national firms. The self-employed operatives obtain 'labour only' contracts, other sub-contractors supply both labour and materials. The local firms are often small firms in which the principal works at the craft with his operatives. In certain trades, notably roof-tiling and floor-laying, manufacturers and material suppliers often contract for the supply and fixing of their own materials, and then sub-let the fixing, on a piece-work basis, to operatives registered with them.

There is some correlation between the proportion of work sub-contracted and the relative level of labour expenditure on the trades carried out by the main contractor. This effect was substantial in the case of carpentry and joinery and noticeable, although less pronounced, in the case of brickwork. It may be that sub-contracting the finishing trades increases the potential efficiency of the main contractor's organization, or it may merely be that the more efficient firms sub-contract on the largest scale.

Incentive Schemes. Incentive schemes can be divided broadly into two groups: target bonus schemes and extra payments. Target bonus schemes take the form of payments of a part, or of the whole, of any saving made against a target set for a unit of work; extra payments are usually an addition to the hourly rate, and are not normally related specifically to output. The use of target schemes does not

appear to be increasing. The survey figures indicated that 25 per cent of the contracts operated target bonus schemes, but in June 1951 the data provided by the Ministry of Works' study of incentive schemes show that it was approximately 30 per cent, and a year later it was a little lower. (Table 3).

In 1947, the National Joint Council for the Building Industry agreed to the application of target schemes within the industry. They recommended bonus payments proportionate to the results achieved in performing a definite task, on the basis of giving an operative of average ability and capacity a reasonable opportunity to increase his earnings by 20 per cent over those yielded by the normal prescribed hourly rate. The use of incentive schemes was not, however, obligatory. While the extra payment type of incentive is not favoured by either side of the industry, it is probable that it is operated on at least 50 per cent of housing contracts. Just under a half of the operatives employed by main contractors are covered by target bonus schemes and these schemes are much more common on large contracts than on small. Of the large contracts, those of £50,000 or more in value, nearly three-quarters had target bonus schemes; less than half the medium-sized contracts had them, and less than a fifth of the smallest contracts. (Table 3).

TABLE 3

DISTRIBUTION OF TARGET BONUS SCHEMES BY VALUE OF CONTRACT

	Value of Contract	*Percentage of Sites operating Target Bonus Schemes*	*Operatives covered by Target Bonus Schemes as a percentage of all operatives employed in house-building*	*Operatives covered by Target Bonus Schemes as a percentage of operatives employed on Contracts with Target Bonus Schemes*
June 1952	Above £50,000	73	68	
	£10,000–£50,000	42	40	
	Below £10,000	18	18	
	Total	29	45	89
June 1951	Total	31	44	82

Source: Ministry of Works. Survey of Incentive Schemes, June 1951 and June 1952.

Extra payments are sometimes made on the basis of skill and speed of production but are also often made for reasons that bear no relation to output, such as to attract or retain labour.

Labour expenditure for main contractors was, on average, 15 per cent less on contracts with target bonus schemes than where no

incentives were paid. Extra payments appear to have had much less effect, but this may have been because such payments were not related to output. The savings in labour cost were less striking since part of the saving was absorbed in payments made under the schemes (Table 4).

TABLE 4

LABOUR EXPENDITURE AND LABOUR COSTS ON CONTRACTS WITH AND WITHOUT INCENTIVE SCHEMES

Trade	*Per House*			
	Average labour expenditure (manhours)	*Net cost of labour expenditure*	*Amount paid as incentive*	*Total cost of labour expenditure*
		£ s.	£ s.	£ s.
BRICKLAYING				
Target bonus scheme	573	81 16	10 9	92 5
Extra payment	629	89 4	5 16	95 0
Standard rate only	688	99 5	—	99 5
CARPENTRY AND JOINERY				
Target bonus scheme	359	50 16	5 0	55 16
Extra payment	448	60 11	3 3	63 14
Standard rate only	418	58 10	—	58 10
PLASTERING				
Target bonus scheme	274	39 1	7 10	46 11
Extra payment	329	46 8	2 12	49 0
Standard rate only	352	49 4	—	49 4
PLUMBING				
Target bonus scheme	127	18 2	2 11	20 13
Extra payment	170	22 5	1 6	23 11
Standard rate only	180	23 17	—	23 17
PAINTING				
Target bonus scheme	188	27 7	2 15	30 2
Extra payment	228	31 19	1 8	33 7
Standard rate only	225	31 4	—	31 4

The distribution of incentive schemes follows no clear-cut pattern. Target bonus schemes and extra payments occur on the same contract and the different trades employed by the main contractor may be rewarded in different ways. There was no evidence that incentive schemes have any marked effect on the quality of workmanship.

Many of the schemes examined in the survey had weaknesses, and contractors found difficulty in setting economic and rational targets, particularly for the less easily measured work. It should, however, not be difficult to calculate targets from the information used for tendering.

Many of the contracts, and even the trades, were incompletely bonused and frequently targets had had to be revised during the

period of the contract; neither very easy targets nor very difficult ones provide much incentive. The development of target bonuses usually proceeds side by side with improvements in organization and as a result difficulties may arise in fixing subsequent target levels. Some of the schemes were very complicated and expensive to administer and in some cases bonuses were calculated upon the output of very large groups of operatives so that the reward was only remotely dependent on individual output. The payment of bonuses to the foremen and agents does not appear to be usual, though it is possible that greater economies might be achieved than when bonuses are paid only to the operatives.

The Size of Contracts. The sizes of contracts for local authority house-building are limited by the availability of suitable sites, by the need to employ to the utmost the resources of the building industry, including the smaller firm, and, except for the largest authorities, by the size of allocation. The largest contracts are normally undertaken only by the largest firms, while the small contracts are undertaken by both small and large firms.

There is evidence that for main contractors the labour expenditure required per unit of work falls with increasing size of contract. The figures given in Table 5, in which a 20 house site is assigned an index of 100, indicate a fall of some 16 per cent over the contract range of 4 to 80 dwellings. These results are in broad agreement with results from other inquiries. This reduction in labour expenditure with increasing size of contract is found to be far more pronounced for bricklaying than for other trades.

TABLE 5

INDEX OF TOTAL AND BRICKLAYERS' LABOUR EXPENDITURE ON CONTRACTS OF DIFFERENT SIZES

(20 *house site, labour expenditure* = 100)

Size of Contract	*Total Labour Expenditure*	*Bricklayers' Labour Expenditure*
4 houses	109	118
10 ,,	104	108
20 ,,	100	100
40 ,,	96	92
80 ,,	93	84

In traditional house-building, the bricklayers, unlike other trades, can usually carry out the greater part of their work in a continuous run and it is possible that were the work so arranged that all trades had a continuous run, then the potential savings with increases in the size of contract would be equally great for all trades.[4]

[4]Where work is planned and progressed, and concentrated into a short building period, it is usually possible to arrange the work of each trade to be continuous.

Similarly it is not surprising to find that the size of contract does not appear to have any marked effect on the labour expenditure of sub-contractors. It is possible that the potential savings from continuous work may be less for sub-contractors than for main contractors, since sub-contractor operatives are often already employed continuously on work of a similar nature even though for different schemes of housing.

The Influence of the Principal. Normally the main contractor's control and organization of the work on the site is in the hands of a general foreman or agent, but in small firms this work is often carried out by the principal of the firm. Such was the arrangement on about a sixth of the sites studied; the principal either acted as a full time supervisor or combined supervision with work at one of the crafts, usually bricklaying or carpentry and joinery. Contracts for which such arrangements were operated were usually fairly small; their average size was 16 houses. The small firms engaged on such work would not normally be able to accept contracts of any substantial size.

Where no incentive bonus was paid the main contractors' labour expenditure was about 15 per cent less on contracts supervised by a

TABLE 6

AVERAGE LABOUR EXPENDITURE FOR MAIN CONTRACTOR PER DWELLING* ACCORDING TO TYPE OF SUPERVISION

Trade	*Contract supervised by Principal*	*Other forms of supervision*
Site Works (General & Bricklayers' Labourers)	748	947
Bricklaying (Skilled)	566	669
Carpentry and Joinery	366	412
	1680	2028
Plastering	313	312
Plumbing	159	166
Painting	221	216
	693	694

* For comparable contracts of an average size of 16 dwellings, on which incentive bonus was not paid.

principal of the firm than on otherwise comparable contracts supervised by a salaried foreman or agent (Table 6). This difference is of the same order as that obtained by the use of target bonus schemes on the larger contracts. Such bonus schemes are not usually operated where the principal is supervising, though some form of extra payment is frequently made. The saving in labour expenditure

arising from supervision by a principal is mainly confined to the three main trades of site works, bricklaying, and carpentry and joinery, possibly because there is a greater scope for site organization in these trades than in the finishing trades, or because the principals normally have had experience in these trades.

On housing, working principal firms are more wide-spread amongst sub-contractors than among main contractors. In the plastering trade, two thirds of the sub-contracts examined were carried out by working principal firms; this type of firm carried out about a third of the contracts for other trades. Such firms worked on contracts of all sizes.

Where a principal worked with his labour on the site the labour expenditure was found to be less than in other cases. The difference is probably a result of a combination of a high rate of output by the working principals, and the effects of their personal supervision. The choice of operatives may also be more selective. There is some indication that, on sub-contracts, the labour expenditure was less where target bonuses were paid than where the principal worked on the contract.

TABLE 7

AVERAGE LABOUR EXPENDITURE OF WORKING PRINCIPAL AND OTHER SUB-CONTRACTORS

Trade	*Working Principal* (*Labour expenditure per house*)	*Other Sub-contractors* (*Labour expenditure per house*)
Plastering	245	259
Plumbing	127	143
Roof Tiling	44	64
Painting	142	175
Glazing	7	11
Electrical Work	42	58

The Experience of Firms. The importance of house-building to individual contractors varies widely. Many small firms concentrate on maintenance and jobbing work, while many of the large firms concentrate on large-scale building construction and civil engineering work. Since the war, some firms not formerly interested in house-building have entered this field. Some of these have set up special departments to handle house construction; others, however, only take housing contracts intermittently and consequently are not so experienced in house-building; the latter undertake between a fifth and a sixth of all the contracts. Firms experienced in house-building achieve their results with about 8 per cent less labour expenditure than other firms and this difference is found for all trades with the exception of painting. (Table 8).

TABLE 8

AVERAGE LABOUR EXPENDITURE FOR MAIN CONTRACTORS WITH DIFFERENT EXPERIENCE

Trade	*Contractors experienced in House-building*	*Other Contractors*
Site Works (General & Bricklayers' Labourers)	896	978
Bricklaying (Skilled)	600	680
Carpentry and Joinery	400	428
Plastering	301	365
Plumbing	161	182
Painting	220	204
Total (for trades carried out)	2578	2837

The majority of sub-contractors examined appeared to handle housing work regularly, but no valid classification by experience was possible.

Site Organization. Effective site organization consists of far more than just the supervision of labour and the quality of work. In order to ensure continuity of production it is necessary to plan in advance the entire work of the contract; to integrate the work of all trades; to order and progress the materials; and to work out the placing and provision of appropriate mechanical plant. It is possible to achieve substantial savings in labour expenditure by careful planning. While it was not possible to obtain any actual measure of the quality of site organization in the recent survey, it is widely held that many building firms give insufficient thought to such organizational problems.

The planning and phasing of the work on the site can result not only in a reduction in the calendar duration of the contract but also in the achievement of continuity of the work of each trade, and so to the minimizing of non-productive time. Further, reductions in the period of the contract and adjustments in the time pattern of the trades are likely to be accompanied by economies in the site services, supervision, welfare, plant and so on, since these are, to some extent, determined by the duration of the contract.

During the period of the survey the average duration of contract for ten houses was 12 months, the duration increasing by 8½ days for each additional pair of houses. This relationship is illustrated in the diagram below, which includes for comparison the expected durations for contracts based on a programme prepared by the Building Research Station.

The use of mechanical aids was very limited, even on the larger sites, and there was some evidence to suggest that the plant was not normally integrated into the organization of the operations, but was used mainly as supplementary labour.

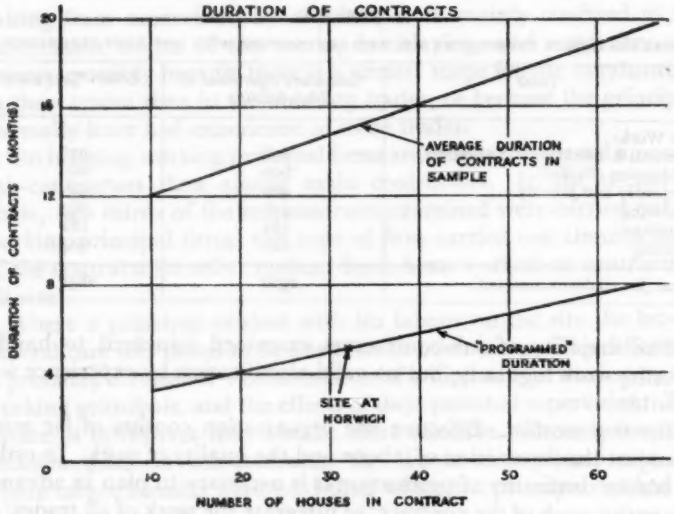

FIGURE I

Regional Differences. For the purposes of the survey, England and Wales was divided into four regions, Northern England (North of the Dee and Humber estuaries), the Midlands (including Wales), Southern England (south of the Severn estuary and The Wash, but excluding London) and the London region. Those regions are reasonably homogeneous and well contrasted in industrial development, population density, and, to some extent, in trade practices and constructional methods.

Contracts tended to be smaller in Southern England than elsewhere, and more of them were obtained by working principal firms and by local firms. Target schemes were used more widely in the Midlands than elsewhere, while extra payments were most frequent in London and Southern England. The amount of sub-contracting was greater in the Midlands and Southern England, and particularly in the London Region, than in Northern England.

Labour expenditure for main contractors in Northern England was 10 per cent lower than in Southern England, the Midlands showing a level intermediate between these two regions. (Table 9). The differences between the regions are mainly confined to the trades of bricklaying and painting, and the work carried out by general labourers, for example site works.

TABLE 9

REGIONAL DIFFERENCES IN AVERAGE LABOUR EXPENDITURE OF MAIN CONTRACTOR

Trade	*Labour expenditure per house*			
	North	*Midlands*	*South*	*London**
Site Works (General & Bricklayers' Labourers)	866	907	972	1130
Bricklaying (Skilled)	583	610	665	608
Carpentry and Joinery	404	403	410	351
Plastering	307	343	299	—
Plumbing	162	166	167	173
Painting	185	208	240	265

*The figures for the London area are based on a relatively restricted sample.

Regional differences were found in the labour expenditure of sub-contractors in the trades of plastering, plumbing, painting, and electrical work; in most cases the lowest figures were achieved by sub-contractors in the Midlands (Table 10).

TABLE 10

REGIONAL DIFFERENCES IN AVERAGE LABOUR EXPENDITURE OF SUB-CONTRACTORS

Trade	*Labour expenditure per house*			
	North	*Midlands*	*South*	*London**
Plastering	262	220	239	—
Plumbing	143	124	150	141
Roof Tiling	59	54	45	60
Painting	152	156	189	—
Glazing	13	11	10	10
Gas Fitting	18	17	18	14
Electrical Work	58	46	56	69

* The figures for the London area are based on a relatively restricted sample.

It is probable that a proportion of these differences can be ac counted for by regional differences in trade practices and methods o construction, but it was not possible to establish this from the survey data. It is possible, too, that regional differences in the industrial climate also had some effect.

LOCAL AUTHORITY DIRECT LABOUR ORGANIZATIONS

The direct labour organizations employ, on average, about 7 per cent of the operatives engaged in house-building. This proportion varies considerably in different regions, reaching nearly 17 per cent in Northern England as compared with about 5½ per cent in the Midlands, just over 2 per cent in Southern England and nearly 7 per cent in London.

The direct labour organizations sub-let work rather less frequently than do contractors, although again there are regional differences — organizations in the north of England sub-letting more of their work than organizations elsewhere.

There is a general tendency for direct labour organizations to employ incentive schemes more frequently than other contractors. Some of the schemes examined were detailed and complex, involving a large amount of measurement and calculation, and normally could only be employed by large firms having extensive administrative organizations.

Too few direct labour contracts were examined in the survey for generalizations to be made with much confidence, but it would appear that, on average, labour expenditure was lowest in the North. This may well be a result of the greater experience of the organizations in those regions, and it is possible that the greater extent of sub-contracting may also have had some effect. It would also appear, from the results obtained, that labour expenditure for the direct labour organizations was, on average, higher than for other main contractors for similar work.

FIRMS AND THEIR EFFICIENCY

Nationally, labour expenditure on house-building costs about £160 million a year. The range of labour expenditure on the various contracts indicates that substantial savings are possible. If the productivity of the below average firms were raised at least to the present average level, the cost of labour expenditure would be reduced by some £12 to £15 million a year. Reductions in labour expenditure usually also result in some savings in overheads. For house-building, the national cost of site organization and site services is probably of the order of £25 million per annum, a large proportion of which is directly related to the duration of the building time and the time pattern of the trades. To some extent the services they represent are used below capacity, and thus substantial savings may be possible.

Excessive labour expenditure may arise from breaks in continuity, waits for materials, and extra labours because of badly sited materials and incorrect or inadequate directions for actual erection, but also from bad time-keeping, excessive rest breaks and work at below optimum effort rates. Losses of the first kind can be reduced by planning and organization, and those of the second by supervision, incentive schemes, and generally good labour relations. While it is impossible to eliminate all elements of unnecessary labour expenditure, the possibilities are greater on large contracts than on small. On large contracts it is possible to obtain the advantages of specializ-

ation, and to make full use of indivisible elements of labour and plant. The general programming and planning of the work is also made easier.

The results given above do not suggest that under present conditions there is any one optimum size or type of firm. The very wide differences in the classes of building with which the industry is concerned demand widely differing types of organization. To some extent the optimum size of the firm is determined by the ability of the principal. His close personal supervision brings advantages which can only be achieved in larger firms by substitutes for this direct control, for example, by the payment of incentive bonuses, which themselves add to the cost of labour. Small firms enjoy the advantages of working in their own locality, but their credit facilities are often inadequate. They may thus, in times of shortage, be badly placed for obtaining adequate supplies of materials, and normally they are unable to make an economic use of mechanical aids. The large firms have better credit facilities, are able to arrange bulk purchase of materials, and generally are able to obtain the economies of large scale working. They have better technical services and are in a position to use mechanical aids economically. On the other hand, they must operate over long distances, and will often incur heavy travelling expenses for their operatives and haulage costs for their plant.

Both experience and specialization have been shown to produce favourable effects on productivity. Specialization on house-building does, of course, narrow the possible field of a firm's activities but this is hardly a serious consideration under present conditions. The extent of the savings in labour expenditure achieved by sub-contractors as compared with main contractors suggests that sub-contractors can achieve lower costs, at least in the finishing trades, and that further savings might be achieved by some extension of the practice of sub-contracting. If, however, this practice were extended nationally on a large scale, and particularly to other sections of the industry, important changes in the organization of the industry would be involved, and it is not easy to predict the ultimate effect on the cost of building.

Reference has already been made to the economies likely to be achieved in overheads by reduction of building time. Much of the delay in the completion of contracts has been blamed on material shortages. After the war, a large national programme of building was launched at a time when manufacturers and distributors lacked stocks; the programme itself was kept at a level at which it absorbed the output of the material-producing industries. On the whole, the

industry has not modified its pre-war policy of relying on the merchants to provide regular and immediate deliveries of materials. The result has been irregular deliveries of materials to the sites which have not only reduced incentive to high productivity but considerably lengthened the duration of building and, inevitably, increased building costs. Reductions in building time need carefully planned site programmes, but such programmes can be maintained only if the supply of materials is adequate. Under current conditions, adequate supplies can be ensured only by the building-up of stocks before commencing construction. Such forward buying will entail additional costs for credit, handling and storage but these will be off-set by the savings resulting from bulk purchases.

Although the present conditions of supply and demand are not conducive to the rapid adoption of changes in practice, it is clear that considerable economies are possible in all the elements contributing to the cost of building.

LONDON

Acknowledgments

The survey on which this report is mainly based formed part of the programme of research of the Building Research Board, and the paper appears by permission of the Director of Building Research.

TRACK COSTS AND MOTOR TAXATION

by A. A. WALTERS

1. IN the field of transport economics, few problems have aroused more heated and prolonged controversy than that of track costs. Railway executives in many developed countries of the world have called upon the Public's sense of fair play to witness the railway's disadvantage in having to pay out enormous sums annually in the form of track maintenance and interest. How can the railways engage in fair competition with road haulage and 'bus firms who do not have to pay for the highways? It is argued that the conditions under which the two great transport industries compete should be equalized; then the rules of the competitive game would be fair to all players and the public would gain a more efficient transport system.[1] The main purpose of this article is to examine the validity of arguments showing that road users should pay for the services of the highways. It is concluded that motor taxation is not, and should not, be related to the cost of the track. Criteria other than the cost of the track should determine aggregate motor taxation. Finally it is suggested that motor taxation should be levied so that the marginal private cost of vehicle operation is brought nearer to the marginal social costs and the degree of congestion on our roads is reduced.

2. Before we can get some idea of the quantities involved, some definition of the term 'track costs' must be given. The arguments about the unfair burden of the railways stem from the fact that road users are not charged specifically for certain kinds of input while the railways have to pay for similar inputs. Without straining terminology, it is impossible to include all of these outlays under the head of track costs; for example, the accounts of road users do not show debits for police traffic control, but the railways must pay for their police. But the major bone of contention is the 'legacy of the past' in the shape of highways. Consequently we shall arbitrarily define track costs to include only those outlays of the railways connected with the maintenance and interest on the permanent way. The interest element is quite an arbitrary figure. Accountants have their own procedures for determining that proportion of the compensation payments which is called the capital cost of the track taken over; the figures have little economic significance. Sir Reginald Wilson (Comptroller of the B.T.C.) estimates the (accounting) interest payments on

[1] See, for example, W. G. Scott, *Economic Analysis of Public Policy towards the Regulation of the Transportation Industries*, Railway Association of Canada.

the permanent way at some £20-25 million.[1] This represents slightly less than 5 per cent of the total outlay of the railways. The other part of the rail track cost, the cost of maintaining the permanent way in a constant state of repair, is by no means an unambiguous concept. Assuming given traffic flows, one can conceive of a *desired* level of expenditure on maintenance which may be defined as the amount that a prudent Corporation would spend annually under normal circumstances. The *actual* level of maintenance expenditure in any year may, because of shortages of labour and materials or because of backlogs, be below or above the desired level. It is more convenient to consider the desired level and to ignore the oscillations in the actual level and the problems to which they give rise. By 1952 most of the backlogs had been made good, and it is not unreasonable to suppose that the desired level was approximately equal to the actual level. The expenditure on maintenance of tracks (excluding those tracks used specifically for rolling stock repairs and for the marshalling of trains) was most probably in the region of £29-£33 million in 1952.

The job of assessing the track costs of highways is much more difficult. The accounts of road building authorities are maintained for administrative purposes only. No attempt is made to assess the annual sum needed to maintain the roads in a given state of repair, and there is no useful distinction between capital expenditure and current maintenance expenditure. From the reports of engineers one may guess that the annual maintenance expenditure required to maintain the roads in a constant state of repair in 1952 was in the region of £90 million, and the actual level of maintenance expenditure was probably about £15 million less than that figure, i.e. £75 million.[2]

3. Two eminent authorities have recently put forward proposals for dealing with the problem of track costs. Sir Reginald Wilson in his penetrating survey of the framework of public transport suggested that the railways should be relieved of the interest payments on the rail track, and future expenditure on laying down permanent way should be amortized over a number of years and these annual payments charged to current account.[4] Presumably (for Sir Reginald does not say this) the £20-25 million would then become an annual burden on the Exchequer. Now this suggestion bears a strong resemblance to the old proposal, found so often in the writings of railway apologists, that the railways should be subsidized. There

[1] 'The Framework of Public Transport', *Journal of the Institute of Transport*, 1953.
[2] Report of Sub-Committee D of the Select Committee on Estimates, May, 1953, H.M.S.O.
[4] Sir Reginald Wilson, op. cit.

may be a good case for subsidizing the railways, but clearly the issue must be argued in a framework much wider than that of track costs; the level of motor taxation, the value of the railways as a part of the framework of defence, the competitive power of the railways and the framework of control — these are but a few of the factors which should be considered before one can pass judgment on proposals for a subsidy.

Brigadier General Sir H. Osborne Mance suggests that the track costs of road transport should be distributed 'in proportion to benefits'.[3] Economic theory would normally suggest that one should measure the 'benefits' each road user receives from the track by finding the maximum amount of money he would give up rather than be deprived of the use of the highways. The patient being rushed to hospital for an urgent operation would give up much more money than the motorist on a pleasure drive. But Brigadier Mance does not face the implications of his proposal for he suggests that benefits are 'conveniently measured by ton- and passenger-miles'. Clearly a distribution of track costs according to ton- and passenger-miles would reflect the relative damage done by vehicles to road surfaces more closely than relative benefits. In any case Brigadier Mance does not establish his assertion that this is the 'fair and logical method'; there are various other methods which some authorities consider 'fair' and one finds it difficult to choose between them.[4]

4. The economic problems of track costs may be divided into three broad categories. First we are concerned to discover a pricing system for the services of the highways which will secure an optimum utilization of the *existing* network of roads, and distribute traffic efficiently between road and rail. Second, there is the problem of securing the optimum level of investment in highways. And third, the effects of the different policies on the distribution of income must be examined.

In the conventional text-book analysis of the behaviour of firms under conditions of perfect competition, the first and second problems are solved by the same pricing system. The firm takes the price of its output as given and expands its output in the short run until short run marginal cost is equal to price. If, at that output, the short term marginal cost is above the long term marginal cost, additional plant will be bought, output will be increased (and as the output of the industry expands, the price will fall) until the long term marginal cost is equal to the price. Thus, the same price system allocates both current inputs and capital assets efficiently between one use and another.

One of the major difficulties with finding a proper price policy for

[3] 'Road and Rail Track Costs', *Modern Transport*, 1953.
[4] See Sir Reginald Wilson, op. cit.

a nationalized industry with falling long run marginal cost curves is that of finding a price system which enables a test of the desirability of investment and which, at the same time, secures an optimum utilization of existing capacity. The usual answer is of course the two part tariff. Any extension of capital equipment is justified if the aggregate of the new fixed charges covers the annual capital charge of the new equipment.[7] At the same time the variable charge should be fixed at a level sufficiently above short run marginal cost to equate demand and supply. The 'price' of output has to be split up into two parts to enable it to do the two jobs.

The highway system is typically an 'industry' with marginal cost curves which are below average cost. In the absence of congestion, the marginal cost of supplying highway services is equal to only the wear and tear on road services caused by the passage of an additional vehicle. In general this would account for only part of the maintenance expenditure, for engineers say that much of the deterioration is due to the climate and, in urban areas, to the excavating activities of public utility undertakings. The average cost is large because of the extensive indivisible expenditure required to construct highways.

In most industries the rigidity of technical relationships between capital assets and output means that any sizeable expansion of output necessarily implies an expansion of capital equipment. Roads are an exception to this empirical generalization. One of the characteristic features about the highways is the high upper limit to the supply of services from a given network of roads. In spite of the vast expansion in post war road traffic in Great Britain, virtually no new capital investment has gone into the roads (see Table 1). Indeed there have been few major changes in our road system since the 1920's. The cost

TABLE 1

		1929	1939	1950	1953 (estimate)
Road Expenditure[1]	£ million	57	65	79	80
" " revalued at 1938 prices	"	53	65	35	33
Number of Motor Vechicles [2]	(000's)	1524	3094	4414	4900
Motor Taxation [3]	£ million	16.5	87	106	294

[1] Year ended March. Includes both maintenance and capital expenditure.
[2] At August or September in each year.
[3] Excludes Purchase Tax on new cars.

of *not* extending the road system has of course appeared in the accounts of motor vehicle operators as a consequence of congestion. But one thing is perfectly clear. There is no danger of over-investment in roads; indeed almost all commentators are becoming increasingly

[7] The fixed charges on output produced from existing equipment should not be raised.

alarmed at the neglect of the roads. Decisions on the level of road investment are taken by the capital programming committee of the Treasury. One would normally expect the committee to take account of the marginal rate of return on road expenditure in drawing up its system of priorities. Several case studies have shown that the marginal rate of return on road investment is probably over 12 per cent.[8] This is certainly a higher rate than that on many other projects (e.g. power stations) which have received the committee's approval. But Governments have found that it is politically and administratively more convenient to reject proposals for road development than those for most other forms of capital expenditure such as, for example, those for housing or for new power stations. The capital programming committee pay little attention to the rate of return on road investment; the state of employment, the degree of inflationary pressure and the overriding requirements of defence and exports are apparently the main factors which they take into account when arriving at a level of road expenditure which 'the country can afford'.[9]

5. Given that the investment in roads is closely controlled and given the absence of any rigid technical relationship between the increase in the volume of road traffic and road investment, it follows that there is no need to introduce a two part tariff for the purpose of providing investment criteria.[10] But there may be other reasons for suggesting a two part tariff. It has often been suggested that road users *ought* to pay the 'interest on capital sunk in the roads'; and if this proposition of ethics is accepted, then, apart from practical difficulties, a two part tariff seems to be the best way of extracting the levy. The variable charge would be equated to additional maintenance expenditure and the fixed charges would cover the interest on capital.

Professor Lewis, for example, believes that road transport should pay for the legacy from the past. After asserting that track costs is the principal problem in transport, he argues:

> In countries where it is decided that track expenditure depends on whether traffic goes by road or by rail, such expenditure is part of marginal costs of traffic, and should be reflected in prices. This is where non-renewable expenditure presents difficulty.

[8] See, for example, C. T. Brunner, 'Transport and Productivity', *Journal of the Institute of Transport*, November 1952.

[9] See Report of Sub-Committee D of the Select Committee on Estimates, 1953.

[10] R. W. Lindholm, in *Taxation of the Motor Trucking Industry*, Ohio, page 31, believes that the provision of investment criteria is important in the U.S.A. Since he does not discuss the factors which do *in fact* govern investment decisions, it is difficult to judge the relevance of his assertion.

> To extend their facilities, both road and rail have to purchase land and put it into a form suitable for tracks. This expense is part of marginal cost so long as the system is not working below capacity. A great battle has raged over the issue whether road transport should pay enough to cover the interest on all past investment of this kind. The railways are expected to pay such interest, if they can, and claim that it is unfair that road transport should get a 'legacy from the past' which they cannot share. Their contention would be the nonsense which economists have usually asserted it to be if there were excess capacity in roads as there is in railways. But there is not. Every extension of the road system involves heavy expenditure on land and conversion, and the charge made to road transport should be a rate which covers this. Given constant marginal cost, road transport *ought* to pay on existing roads not only their maintenance but also interest, and given rising marginal cost it should also pay a rent.[11]

Professor Lewis seems to be considering a government which spends money on new roads when the volume of traffic exceeds the capacity of the old roads. As we suggested above, the word 'capacity' is particularly vague and elusive. In principle, one could calculate the savings to road users in terms of petrol, tyres, etc. which would result from new road construction. If this figure exceeds the annual service charge on the capital investment, we might say that the traffic exceeds the capacity of the roads. But the definition depends ntimately on what items we include in savings and the prices that are used; when one tries to allow for an increase (or reduction) in the number of accidents the problem becomes unmanageable. Secondly, it will be observed that by marginal cost Professor Lewis is not considering the additional cost of supplying a road *service*, he is presumably concerned with the marginal cost curve of the industry which supplies *roads* — the assets from which road services are derived. It is not obvious why a price should be charged for a road *service* when, in the absence of congestion and maintenance costs, the road service could not be transformed into anything else of value. One reason for charging a price may be that of avoiding over-investment in roads. This appears to be one of the considerations Professor Lewis has in mind. In his model the government expands road investment as road traffic increases, and he is anxious to avoid an 'uneconomic' increase in road traffic which would 'cause' the government to expand the road system. But as we argued above

[11] Lewis, *Overhead Costs*, pp. 35-6 (my italics).

there is no problem of over-investment in the U.K. and governments do not build new roads as traffic increases. In this respect, Professor Lewis's model is irrelevant as far as Britain is concerned.

The ethical proposition that road users *ought* to pay something for their inheritance from the past is accepted by many people. The difficult problem is to assess what is a 'reasonable' or 'fair' figure and what is an equitable distribution of the burden. Professor Lewis suggests that 'road transport ought to pay ... interest, and given rising marginal cost it should also pay a rent'. It is not clear what sort of marginal cost curve Professor Lewis has in mind, nor do we know what assumptions have been implicitly made about changes in the price level. However, in conditions of constant marginal cost, it seems that Professor Lewis would value the roads at replacement cost and charge interest on this sum; this would give an annual interest charge in the region of £90-120 million in 1952. The Salter Conference,[12] on the other hand, was concerned with finding an equitable distribution between the two main types of road use — 'community use' and 'vehicle use'. The Conference assumed that the 'legacy of the past' enjoyed by motor users was equal to the proper allowance for community use. There is no need to emphasize the arbitrary character of this assumption — but the Conference thought that it was not too far out as a first approximation. There is no objective method of determining the 'fair' value and 'equitable' distribution. In practice the economist must be concerned with the problem of finding the effects of various acceptable distributions.

6. One of the most interesting aspects of the controversy on highway costs and motor taxation has been the tenacity with which most of the authorities have adhered to the contention that motor taxation should be used *only* for the purpose of maintaining, improving and extending the network of highways. In his pioneering study Wilfred Owen said that 'gasoline tax receipts should not be diverted to other purposes.'[13] But this is essentially an American view, and of course transatlantic conditions are quite different from those in Great Britain. The high standard of highways generally required by state governments, the large distances, and the successful opposition to increased gasoline taxes by road users have meant that current highway expenditure is outstripping road user taxes.[14] In Great Britain, on the other hand, motor taxation has regularly exceeded the

[12] *The Report of the Conference on Rail and Road Transport, 1932*, H.M.S.O., pp. 15-17.
[13] *A Study of Highway Finance*, Harvard, 1934.
[14] See Owen and Dearing, *Toll Roads and the Problem of Highway Modernization*, Brookings Institution, 1952. For the experience of North Dakota, see Nelson and Dodge, *Financing North Dakota's Highways, Roads and Streets*, 1952. See also Gilbert Walker, 'Road and Rail Transport in Nova Scotia' in *Reports of the Nova Scotia Economic Council*, 1941.

expenditure on roads since 1936: in 1952-53 the taxation extracted from owners of motor vehicles was three times the year's expenditure on the roads. In spite of protests from pressure groups of road users the road fund has ceased to exist except as an accounting fiction. Governments have increased taxes in a laudable attempt to improve the balance of payments and to damp down internal inflation. Dollars and many other foreign currencies have been (and are) worth far more than their apparent value; and, for example, the purchase tax on vehicles in the home market has brought the home purchase price nearer to the dollar opportunity cost. Considerations of this kind have been rightly far more important in determining the level of motor taxation than 'equalizing the conditions under which the two great transport industries compete'.

7. If aggregate taxation on motor transport is determined by the considerations outlined above, we may then usefully employ arguments concerned with the ordinary allocation of resources criteria to find the efficient distribution of the aggregate burden between road users. One may suggest, for example, that motor taxation should be distributed so that passengers and traders are induced to fill up the excess capacity at present hauled by the railways;[15] the additional cost of carrying such traffic by rail is likely to be much less than the additional cost of carrying by road. But most economists would be inclined to argue that the problem of empty haulage and light train mileage could, and indeed should, be solved by the price-output policy of the railways. Taxation is a poor second.

Another criterion, and I think a more substantial one, may be developed on the basis of the distinction between marginal private and marginal social cost. In the first edition of *Wealth and Welfare*,[16] Professor Pigou produced the famous example of two roads connecting two points. One of these roads is assumed to be wide enough to accommodate all the traffic which might possibly use it, but it has a bad alignment and surface. The other road has a much better alignment and surface, but it is narrow and after a certain level of traffic flow there is some congestion. The additional private cost of a vehicle travelling over the narrow road will be reflected in the accounts of the firm or person operating the vehicle. If the vehicles are owned individually by a large number of firms and if no charge is made for the services of the road, the traffic level will be determined by the condition that marginal private cost equals price. But when the road is congested, an additional vehicle increases the costs of

[15] Some idea of the excess capacity hauled in rail passenger transport is to be found in *Report and Accounts of the British Transport Commission, 1951*, p. 72. The evidence is flimsy but not insignificant.

[16] p. 194.

vehicles already using the road because congestion is increased. The additional costs of intra-marginal vehicles are not reflected in the accounts of the marginal vehicle, but, if factor prices are constant,[17] they must be classified as part of the marginal social cost of transport on the narrow road. In these conditions, the number of vehicles using the narrow road will be greater than is socially desirable. It is argued that a tax should be imposed on vehicles using the narrow road so that the full marginal social costs are reflected in the accounts of individual vehicle operators. In modern terminology the difference between private cost and social cost would be called external diseconomies.

Of course it would be very difficult to measure the marginal private cost and marginal social cost curves in practice. The ideal tax would vary between one road and another and at different times on the same road.[18] Furthermore, the slow wide vehicles contribute much more to the degree of congestion than fast narrow vehicles. And even if we did know the pattern of the curves, it would be most difficult to devise administrative measures which would re-allocate the volume of traffic such that the deviation between marginal social cost and marginal private cost is minimized. Nevertheless, it is clear that measures such as an annual licence fee for vehicles using the central areas of large towns would be a move in the right direction. For example, a special 'London licence' would have to be acquired and displayed before vehicles could use the roads of central London between 8 a.m. and 6 p.m. Administration of this scheme would be easy for it would fit simply into the present licensing scheme. Parking clocks, and a licence fee for Oxonians to keep bicycles, would also help. Furthermore, if we are to have toll roads the gate should be erected in Oxford High Street, not on the by-pass.[19] The funds could be used to relieve the sorely pressed county boroughs who, at present, receive no grant in aid of their roads.

[17] The assumption of constant actor prices must be made since increased factor prices imply increased producers rents, and rent cannot be reckoned as a social cost. See: Allyn A. Young, 'Pigou's Wealth and Welfare', *The Quarterly Journal of Economics*, August 1913.

[18] Professor Lewis, on the other hand, seems to suggest that low taxes should be imposed on roads which have a high traffic density and high taxes on those of low density. See *Fixed Costs*, pp. 37-38.

[19] One may get the impression from Professor Knight's article ('Some Fallacies in the Interpretation of Social Cost', *Quarterly Journal of Economics*, 1925) that a private enterprise road system would do the job much more efficiently. (I do not know whether Knight would accept this interpretation.) Or one might still have publicly owned roads, each with a toll gate and a separate manager for each gate; then the state would instruct the managers to maximize their profits. But it is clear that neither of these systems would lead to the ideal allocation. Some frightful state of oligopoly would emerge in both cases; some form of collusion would be likely as the ultimate outcome of the first case.

8. The conclusion that motor taxation should be distributed so that the degree of road congestion is minimized is quite different from the proposals of those who advocate toll roads.[20] It is usually argued that those who benefit from the construction of the new road should pay for its services. But any such toll charge must appear to the vehicle operator as part of his marginal cost, and some traffic will be diverted to other free roads or to the railways. If the difference between marginal private and marginal social cost on the alternative free roads is still less than the difference on the toll road, the toll charge is desirable. But this would be the case only where the toll road, in spite of width and good alignment, was still more congested than the alternative free roads. Clearly these conditions are unlikely; the new by-pass, for example, is usually much less congested than the High Street.

The main point in the argument for the orthodox toll charge on *new* roads, irrespective of the degree of congestion, is that the charge would not greatly affect the distribution of income. Those who benefit pay the annual charges of the new road. If the charge for each kind of vehicle were fixed at a level equal to the money value of the private saving of petrol, time, etc. occasioned by the construction of the new road, the distribution of income would not be affected.[21] But in general one would expect that the toll would be fixed below the money value of the private savings; if the charges are fixed so that they cover the annual interest and expenses on additional maintenance, the users of toll roads would be somewhat better off. And if the rate of interest measured the social return of the resources in the best alternative use, no one would be worse off.

On the other hand, the system of toll charges on *congested* roads (which are unlikely to be new roads) and the charges in motor taxation which were suggested above will bring about much larger changes in the distribution of income. Some cancelling out of gains and losses will occur but this is not likely to go very far. In general one would expect a redistribution of income from large urban areas to agricultural areas. Of course we cannot say whether this is desirable, but it is not inconsistent with the policies of post-war governments. If we can assume that the redistribution is not undesirable — or that some rough form of compensation payments (such as the suggested changes in the grants made to local authorities) could reduce the undesirable effects — the case for reducing the

[20] Cf. *The Report by the Transport Users' Policy Committee of the Federation of British Industries.* The Report, which was approved by the F.B.I. Grand Council, was submitted to the Chancellor of the Exchequer on November 17th, 1953.

[21] In principle we should also take account of the different values that road users put on the time saved!

degree of congestion by using the price mechanism is established.

9. The railways, on the other hand, will not have a similar distinction between social and private cost. The trains travelling over the rail track are all owned by the same Corporation and, in calculating the additional cost of running an extra train, the additional costs caused to other trains would be included. The additional social cost would be equal to the additional private cost. If we do eventually have a system of railway rates based on 'direct cost'[11] (plus a contribution to indirect costs depending on the demand curve), the argument for basing the distribution of motor taxation on the suggested criterion will be strengthened.

10. The aggregate level of road investment is determined mainly by the level of activity in the economy generally, and only to a very small degree by the number of vehicles using the roads. While some inflationary pressure is present, road investment is likely to be kept down at a minimum; and, if unemployment appears, the social cost of road investment is, of course, zero. Since the gains from additional road investment are widely diffused and most difficult to measure, it seems that the main danger is aggregate under-investment, rather than aggregate over-investment.[12]

But whatever the level of aggregate investment in roads, we can set out certain rules for the distribution of this total between different road schemes. In principle we could allocate road expenditure so that the total satisfaction resulting from that expenditure is maximized. But, of course, this is not practicable; total satisfactions cannot be measured even with the aid of a price system. Alternatively, one may suggest that the aim should be to minimize the aggregate cost of existing traffic, i.e. allowing for the re-allocation of existing traffic between roads, but not for new traffic which arises due to the new constructions. Road building schemes could be put in an order showing the return as a percentage of the capital sum in terms of (a) the reduction in cost of the existing traffic plus (b) the reduction in cost due to the re-allocation of traffic between roads less (c) the annual service charge on the capital expenditure. This criterion will, in general, lead to results which are different from those of the former criterion, but in any practical ordering of road improvement schemes the difference is likely to be insignificant when compared with the errors of estimation.

Road building authorities do not, of course, adopt any one criterion. To some extent they are at the mercy of the civil engineers

[11] 'Notes on Traffic Costing', *Report and Accounts of the British Transport Commission*, 1951, Chapter 2 (App.).

[12] Cf. Walker, Beesley and Walters, 'Transport Productivity and Road Investment', *Westminster Bank Review*, May 1953.

who have quite different standards from those outlined above, and perhaps to a much greater degree, local authorities must pay attention to the demands of the local electorate.[24] The difficulties inherent in the job of measuring the divergence of the existing pattern of expenditure on roads from the desirable pattern are formidable. At present we must rely on general impressions.[25] But one suspects that the divergence is considerable. For example, the extensive pattern of wide roads which have been laid down on new housing estates since the war contrasts strongly with the narrow bottlenecks on main roads burdened with heavy traffic. Even within the framework of our existing knowledge, much can be done to co-ordinate and plan efficient programmes of road construction and maintenance.

UNIVERSITY OF BIRMINGHAM

[24] The maintenance and extension of 'trunk' roads is, however, the responsibility of the Ministry of Transport.
[25] Cf. Report of Sub-Committee D of the Select Committee on Estimates.

THE EFFECTS OF REQUIREMENTS CONTRACTS ON COMPETITION

by GORDON SHILLINGLAW

ONE of the functions of the presidential commission which was recently appointed to study the scope and operation of the federal antitrust laws is to examine the economic situations under which legal action would be justified. The problem to which this paper is directed is to determine the circumstances under which the type of exclusive dealing arrangement known as the term requirements contract may be injurious to competition. An attempt will be made to construct an analytical framework within which any given set of requirements contracts may be fitted to determine its probable effect on competition in the market for the goods covered.

WHAT IS A REQUIREMENTS CONTRACT?

A requirements contract is an arrangement under which the buyer agrees to purchase and the seller agrees to supply the buyer's total requirements of particular goods during a specified period of time. Agreements which cover only part of the buyer's needs are thus excluded, so that this paper is limited to a study of the total requirements contract.

The use of these agreements is subject to limitations imposed by both the Sherman and the Clayton Acts. Section 3 of the Clayton Act, which most specifically relates to this area, reads in part, 'It shall be unlawful . . . to lease or make a sale or contract for sale of goods . . . or fix a price charged therefor . . . on the condition that the lessee or purchaser thereof shall not use or deal in the goods . . . of a competitor . . . where the effect . . . may be to substantially lessen competition or tend to create a monopoly in any line of commerce'.[1]

While there are no statistics available to show the extent to which such contracts are used in the United States, the list of products covered at the present time or in the past is extensive. Gasoline, motor oil, metal cans, shirts, automobiles, shoes, hats, paint, rubber tires and photographic equipment, to name only a few, have been or are being distributed in this manner. Both consumer and industrial goods are included in the list. Yet few cases involving requirements contracts have been instituted by the U.S. Department of Justice in the forty years since the enactment of the Clayton Act. Through 1952 only nine cases brought under Section 3 had been decided by the Supreme Court. Of these, four dealt mainly with tying clauses

[1] 38 Stat. 731; U.S.C., Sec. 14.

and one was dismissed on the grounds that the transactions involved were of agency and not of sale. Only four cases were concerned primarily with requirements contracts, and of these two were private actions.[2] A considerable number of cases have been decided in the lower courts, however, or settled by consent decrees.

Recently, the Antitrust Division has shown an interest in applying Section 3 of the Clayton Act against users of requirements contracts. The most recent case to be examined in detail by the Supreme Court was brought against the Standard Oil Company of California and decided early in 1949.[3] The court declared that the firm's use of requirements contracts with its independent service station dealers was in violation of Section 3, even though these agreements covered only about 6.8 per cent of gasoline sales in seven western states. A more recent pair of actions, brought against American Can Company and Continental Can Company, led to consent decrees which may well effect drastic changes in the pattern of distribution in the metal container industry.[4] These cases provide important legal precedents and indicate that consideration of the effects of requirements contracts is timely.

IMPACT OF REQUIREMENTS CONTRACTS

The significance of the use of requirements contracts is that it may raise the barriers to the entry of new firms or to the expansion or survival of existing firms by preempting the outlets for competitors' goods. The direct impact of the signing of a requirements contract by a buyer is that for the term of the contract he is not free to make purchases from other sources even if the goods are offered to him on more attractive terms. Conversely, other sellers are deprived of one outlet for their goods until the contract expires. If enough outlets are preempted in this manner, competing sellers may encounter great difficulty in getting their goods before the public.

In a limited sense, any successful attempt to sell goods has this restrictive effect. Every sale excludes all potential competitors from the portion of the market represented by that particular transaction. The same sale cannot be made by two competitors. But the restrictive effect of such a sale is highly limited. Among a group of sellers competing for a particular sale, one must be successful, the others

[2] Standard Fashion Company v. Magrane Houston Company, 258 U.S. 346 (1922); Pick Manufacturing Company v. General Motors Corporation, 299 U.S. 3 (1936); Fashion Originators Guild of America v. Federal Trade Commission, 312 U.S. 457 (1941); Standard Oil Company of California v. United States, 337 U.S. 293 (1949).

[3] Op. cit.

[4] Cf. United States v. American Can Company, 87 F. Supp. 18 (DC Cal, 1949) and mimeographed decree.

unsuccessful. The essence of the competitive system lies in competition *before* each sale. The fact of the sale itself does not remove this competition but is its direct result. A requirements contract, however, increases the interval between 'sales'. Competition has fewer opportunities to exert its influence; it centers about the expiration dates of the contracts instead of about individual order dates.

Similarly, a contract for the sale of goods for future delivery effectively excludes all competitors from the market segment represented by the order, but only *after* the sale is made. In some respects the requirements contract is similar to a contract for future delivery; its terms call for the delivery of goods in the future under a present bargain. However, the distinctive characteristic of a requirements contract is the removal from the market of the *total* purchases of the buyer for a specified length of time. Supposedly, when a buyer buys goods for future delivery he is still free to buy more goods elsewhere whenever he pleases, although the size of his original purchase may, in effect, preclude such action.

THE POWER TO EXCLUDE

The question raised by the use of requirements contracts is therefore one of exclusion or of the power to exclude and not necessarily of control of price or output in the market. These agreements may be employed in an effort to obtain or to maintain market control, but the force of the contracts is focused upon their power to exclude others from the market.

The power to exclude is the power to limit or deny to competitors access to the market; that is, the ability to place a substantial proportion of the market potential outside the reach of rival firms. The requirements contract is simply one means of implementing this power, and its use can restrict competition only when the power to exclude is present. Although every requirements contract removes one potential outlet for rival sellers' goods, one such contract is, in all but monopsonistic or concentrated oligopsonistic markets, insufficient to produce harmful exclusion. A system of these contracts, insisted upon by a seller who already has the power to exclude, will, however, exert a restraint upon competition. The problem, therefore, lies in discovering what factors confer this power upon a seller, thereby rendering his use of requirements contracts injurious to competition.

1. *Sources of the Power to Exclude.* A seller may have the ability to shrink his competitors' market share and to block the entry of new firms under three types of situations:

a. His 'product' is not significantly differentiated from those of his rivals, but he possesses important cost and/or locational advantages not readily available to other firms in the market.

b. His 'product' is not significantly differentiated from those of his rivals, but his differential advantage in financial strength and resources is great.

c. His 'product' is differentiated from those of his competitors in such a way as to confer upon him great market power, and the number of satisfactory outlets for his and competitive goods is effectively limited by some environmental factor.

Possession of the power to exclude, stemming from any of these three sources, does not imply that this power will be exercised. In fact, there is a good deal of evidence that it has not often been exerted in the modern industrial age. Our problem, however, is to examine the conditions that give rise to exclusionary power, whether or not it is exercised, to see how the use of requirements contracts is related to this power.

The most efficient producer or distributor in a market for a homogeneous product possesses the power to exclude, provided: (a) that his unit costs will not rise sharply as his market share expands; and (b) that competitors do not overtake his technological lead before they lose out through inefficiency.

Similarly, large differences in the financial strength of firms in the market may also permit the strongest firm, by virtue of its ability to sustain large short-term losses, to drive out competition by selling at prices below competitors' average variable cost and, by the threat of doing this, to forestall new entry ventures. Again, the strong firm can only achieve this result if: (a) any diseconomies of scale are relatively small; (b) the development of competitive technology is slow; and (c) the investment and technological barriers to entry are high.

The third source of exclusionary power is more complex and much harder to define. A seller whose product occupies a large share of the market and commands a far greater consumer preference than any competing product may have this power to exclude. If there are important barriers to the establishment of alternative market outlets by or for competitors, preemption of existing distribution channels will tend to force rivals from the market and preclude the entry of new firms. The conditions under which requirements contracts might be used to accomplish this result remain to be shown.

2. *Relevance to the Requirements Contracts Problem.* In either of the first two situations just discussed, the requirements contract would neither contribute to nor implement the power to exclude. The requirements contract can be economically restrictive only if the seller's

product possesses some advantage which will induce buyers to enter into exclusive dealing arrangements even if competitive products are priced as low as or lower than that of the requirements seller and even if the terms of sale for these competitive products are comparable or superior to those offered by the requirements seller. If the product is truly homogeneous, the buyer will lack this inducement to deal exclusively. And because price and terms of sale tend to uniformity in these markets, it is reasonable to assume that all sellers can find outlets for their goods as long as they can finance their losses, whether or not the efficient firm insists upon requirements contracts.

Thus, although the power to exclude may be present in the market for a homogeneous product, this fact is irrelevant to the issue of whether or not the use of requirements contracts is detrimental to competition. Product differentiation is an essential requirement. Unless the product of one seller carries with it some distinctive property (real or imagined) not offered by a competing product, the buyer will have no incentive other than price or terms of sale to prefer one source of supply over another. (Buyers' loyalty to a particular seller because of the latter's excellent trade reputation or past performance is subsumed under the term 'product differentiation', the 'product' being defined as the entire package traded).

For example, uncertainty as to the size of the season's pack makes it difficult for food canners to estimate in advance their requirements of metal containers. The willingness and ability of the large container manufacturers to guarantee an adequate supply of containers at a given price without requiring the packer to purchase more containers than he actually needs is sufficient to lead the packer to seek the protection granted by a requirements contract. Here the 'product' of the container manufacturer includes the assumption of part of the risk which would otherwise have to be borne by the packer. In addition to bare cans, the manufacturer supplies excess capacity to meet peak demands, as well as pricing restraint to assure that shortage prices will not be charged. He also removes from the packer's shoulders the risks and costs of holding excessive inventories of cans. These and other ancillary services have become essential requisites of entry and survival. Without them a seller cannot obtain a requirements contract no matter how large or efficient he may be, as long as others are willing and able to offer a 'product' with these attributes.

Even when the product is truly homogeneous, however, the use by all existing sellers of a universal system of requirements contracts may make it difficult for a newcomer to the market to obtain outlets for his goods, provided that there are good reasons why the total number of outlets cannot be increased substantially. Thus, even if the product

is homogeneous, the fact that existing buyers are all under contract will make it difficult or even impossible for a newcomer to obtain a foothold.

Generally speaking, however, the exclusionary power conferred on a seller by virtue of his superior technological or financial position is not germane to the requirements problem analyzed in this paper. A differentiated product is a necessary condition for a harmful implementation by requirements contracts of the power to exclude because only an observable degree of product differentiation would induce buyers to agree to deal exclusively with one seller when alternative sources of supply are available on comparable conditions as to price and terms of sale. And, if the product is differentiated, this might provide the basis for preempting the outlets available to competitors' goods. Therefore, it is this situation, alone of the three listed above, which must be investigated; this is the subject of the succeeding sections.

CONDITIONS NECESSARY FOR EXCLUSIONARY EFFECT

A policy of selling only on a requirements contract basis cannot have a significant exclusionary effect unless three conditions are present simultaneously:

1. Possession, through wide product differentiation and substantial market preference, of a significant degree of monopoly power.
2. A market in which the number of satisfactory sales outlets is effectively limited.
3. A contract period longer than the buyers' customary purchasing period.

1. *The Importance of Monopoly Power.* The requirements contract is unlikely, except perhaps in an industry's infancy, to be useful as a means of obtaining the market share which is one of the major hallmarks of monopoly power. A small market share is, *a priori*, evidence of the lack of a sufficient degree of coercive power to induce buyers in large numbers relative to the size of the market to enter into exclusive dealing arrangements with the seller. A degree of recognized (or buyer-imagined) product superiority strong enough to cause most buyers (if required to decide whether to handle or use the seller's goods exclusively or not at all) to enter into requirements contracts is inconsistent with a small market share. If the seller's market share is small, the average resale buyer will lose both revenue and profit by making the former choice. If the seller's market share is small but all sellers follow a policy of selling only on a requirements basis to resale buyers, attempts by any one small seller to increase his share by preempting additional outlets will presumably meet strong

resistance from competing sellers. Furthermore, these attempts will suffer diminishing returns insofar as they are successful because consumer loyalty to competing brands is likely to raise the profitability of individual outlets for rival goods so as to make it less advantageous profit-wise for those outlets to change their source of supply.

For example, consider the following hypothetical situation in which a local market contains 18 retail shoe outlets, 3 of which deal exclusively with seller A, and the remaining 15 deal exclusively with 5 different competing sellers. Each of seller A's stores sells $100 worth of shoes a day; each of the other 15 sells $80 worth. Assuming, for simplicity of exposition, that retail prices are uniform and that some buyers of competing brands will remain loyal to the brand rather than to the outlet, the situation after the preemption of 5 more outlets by seller A might be something like this:

	Seller A's Stores:		Competing Stores:
	Nos. 1-3	*Nos. 4-8*	*Nos. 9-18*
Sales per Store	$100	$70	$85
Total Sales	$300	$350	$850

Loyalty to brands B through F becomes increasingly concentrated in fewer outlets, thus imposing a limit on seller A's efforts to expand his market share by means of requirements contracts.

In an actual situation, the extent to which this barrier would be effective would depend on the degree of brand loyalty, the disparities in profit margins, and similar factors acting upon profitability per outlet. This tendency, however, when combined with the fact that competing sellers are not incapable of retaliation, will place severe restrictions on the ability of a seller with a small market share to use requirements contracts as a means of expanding that share.

Similarly, if the product is an industrial good, the seller's small share indicates that his product is not markedly superior to or cheaper than competitors' in all its possible applications or at least that there are serious divergencies of opinion among customers on this point. Many of the seller's present customers may be willing to buy exclusively; industrial buyers who prefer competing products anyway will not care what the seller's policy is.

A firm with a small share of an embryonic market might be able to use requirements contracts as a means of excluding competitors if it can offer buyers a better promise of product quality and reliability. A small firm in an established market with a revolutionary new product design or production process may be in a position to induce substantial numbers of his competitors' outlets to purchase exclusively from him. In both of these cases, however, this expansion

of market share could and probably would be achieved either with or without requirements contracts, due to other factors which have not yet had time to reflect themselves in market share.

Granted, then, that a small market share provides an inadequate base for utilizing requirements contracts to obtain the power to exclude, it remains true that the seller who has the power to exclude may be able to use requirements contracts as a means of implementing that power. Competitors may not be able to retaliate successfully by the adoption of similar tactics if the dominant firm's products are essential to the buyer's business whereas those of the smaller firms are not. If there is a strong consumer preference for the particular product over substitute brands, all outlets in a given market might prefer to handle it; if exclusive dealing contracts are involved, this will mean that the outlets for competing goods will be much fewer and possibly less desirable. An initially strong resale volume, coupled with some characteristic of the market which permits only a slow rate of growth in the resale volume of competitive products which are comparable or superior to the requirements seller's goods, can produce the same result. Thus, when a new carburetor was first placed on the market, the Carter Carburetor Corporation was able to force carburetor service station operators not to stock the new line by virtue of the fact that replacement sales could not hope to match the dollar volume of replacements for Carter carburetors for several years after adoption of the new line by motor vehicle manufacturers.[8]

If the large firm is not dominant, but has one or more large competitors, its adoption of exclusive dealing contracts will not act to exclude these other competitors, inasmuch as there will likely be as many customers who will prefer to handle the competitor's line as will choose the product of the firm initiating the practice. If other large firms in the market are forced to retaliate by adoption of similar policies, the combined effect of the collective, although not necessarily collusive, actions of these large competitors may very well act to protect their entrenched position and prevent any further inroads by 'outsiders'.

Briefly then, size itself is not sufficient to render the requirements contract a restrictive practice, but it is a prerequisite for restriction. The small producer possessing insufficient 'leverage' to induce dealers to carry his products exclusively cannot preempt more than a small portion of the channels of distribution. Substantial control of the market is necessary to effect this result.

2. *Limitation on the Number of Outlets.* The second element which

[8] Carter Carburetor Corporation v. Federal Trade Commission, 112 F. 2d 722 (1940).

must be present to permit a seller to use requirements contracts as a means of foreclosing large sectors of the market to existing or potential competition is an effective limitation on the number of economically satisfactory outlets in any given market. If the number of outlets for his goods is not so restricted, the small seller will always be able to find new buyers if forced out of sale contact with purchasers who have entered into requirements contracts. Thus, if a men's shirt manufacturer loses a number of outlets in a particular city, he can probably find many other retailers willing and able to market his goods.

Exclusion implies more than inability to obtain a sufficient number of outlets for distribution of the goods, however; effective exclusion can be shown if the system of contracts entered into by any seller puts his competitors under a handicap disproportionate to their relative efficiency and advantages of location.[4] This will be true if these sellers are forced to distribute their goods through outlets which are either limited in number or less favorably regarded by the consumer.

What, then, constitutes effective limitation of the number of satisfactory outlets available to competitors of the requirements seller? The causes of limited opportunities for setting up an adequate competitive distribution system are of two types — financial and institutional.

One institutional factor which imposes a limitation on the number of satisfactory outlets open to a seller of consumers goods competing with a dominant rival or group of rivals is that of locational monopoly. In most markets there are 'better' locations which are frequented by more consumers than others. Since all the department stores are located in a relatively small area in most cities, for example, the mere fact that stores outside this area are not under contract to buy their requirements of certain goods from a particular seller will not be of much assistance to a rival seller who wishes to secure a profitable distribution of his goods. True, he can sell to these other stores, but if he is excluded from the stores in the 'best' locations he is obviously handicapped in his sales effort. This is not to imply that all the 'best' locations need be close together. The retail store of a large mail order house may be on a par with the largest department store in a given city, even though it is located on the outskirts or in a suburb. What is important is that, whatever the best locations may be, they are already occupied by stores which are committed to the exclusive handling of a given line of goods and are therefore not available to competing sellers.

[4] Cf. Myron W. Watkins, *Public Regulation of Competitive Practices in Business Enterprise*, 3rd ed. (New York: National Industrial Conference Board, 1940), p. 212.

Another institutional factor which may operate in consumers goods markets is custom and consumer habits. If the goods are customarily distributed by a given group of outlets to which customers will go when in need of these products, preemption of these outlets will place potential competitors under a serious handicap unless consumer buying habits can be changed. This is the phenomenon of joint distribution of partially complementary types of goods; dealers cannot operate efficiently without a full line, and the goods cannot be marketed economically except in conjunction with other complementary products. The effect will be compounded if the dealers cannot exist profitably without the products of the dominant firms but can carry on their business with but slight loss of income if they are unable to carry competing products.

If, on the other hand, the market is such that consumers will forsake customary outlets, competing manufacturers may be able to develop their own sales channels and the effect on competition may be less. For most consumer 'specialty' goods (passenger automobiles, for example) this will be the case. From an economic standpoint, of course, this may result in an uneconomic allocation of resources and heavy transfer costs. It may also impose high selling costs on new firms, thus raising a bar to entry and preventing the public from benefiting from cheaper substitutes. Exclusive dealing in retail gasoline stations, for example, may well inhibit the entry and growth of firms without established brand preferences. The huge investment necessary under these circumstances to establish an adequate system of outlets would exclude all but the largest competitors from any but small, local markets. In addition, this enforced forward integration increases the risks of investment and raises the entry barrier still higher. With this in mind, the courts have ruled that they cannot order a firm to set up its own system of distributors, even though it would be physically possible to do so.[7]

If the demand for the product is so limited as to preclude profitable operation of more than a few outlets in each market area, preemption of such outlets by a dominant firm may well foreclose competition in these areas. This will hold true regardless of the nature of the goods themselves. A case in point is International Harvester's early use of several brands, selling one through each of all the outlets in a given market area, thus excluding competitors from the use of those outlets.[8]

Along this same line a further distinction can be made. If a large

[7] Carter Carburetor Corporation v. Federal Trade Commission, op. cit.

[8] Cf. U.S. Federal Trade Commission, *Report on the Causes of High Prices of Farm Implements* (Washington: Government Printing Office, 1920).

seller sets up his own system of exclusive outlets, the effect on competition will be less than if he deals through pre-existing outlets. When the former policy is adopted, it is usually accomplished by setting up agents for the company's products and then transforming these agents into exclusive dealers in the firm's goods. Often the term 'agency' is still used in the company's contracts, but the actual substance thereof is such as to make the transactions involved those of sale, not agency. It is up to the court to determine whether or not these agencies are agencies in substance or only in form; if the latter, the contracts come within the province of the law; if the former, then the arrangements are outside the scope of the Clayton Act, inasmuch as principal and agent are one party in the law and thus cannot be the source of any restriction or restraint of trade.

Most of the foregoing pertains directly to those products which are sold by the manufacturer to dealers for resale to the ultimate consumer without any further changes in the physical form of the goods, but the analysis can be extended readily to cover supplier-processor relationships. In this case, the alternative available to the supplier who finds himself facing a limited number of potential customers and strong, firmly entrenched rivals is that of integrating forward into the processing industry. The added investment and risks which this would entail may or may not be as great as those which obtain in manufacturer integration into wholesaling or retailing, but they do pose a barrier to the entry of new firms by increasing the required investment and the problems of management. This may be offset by the larger potential profits to be obtained through forward integration, but this possibility is no justification for the continuance of a system which forces a new firm into operation at two stages of the productive or distributive process as a condition of entering into the higher stage. It would be sheer economic nonsense to require a new manufacturer of metal containers, as a condition of going into business, to become a packer of tinned kippers as well.

3. *Term of the Contract.* The period of time covered by a requirements contract may be relevant to the problem of exclusion. There are three general types of contract period: (a) a contract of indefinite term, cancellable on 30, 60 or 90 days' notice, but otherwise continuing in force on a self-renewing basis; (b) a one-year contract; and (c) a fixed period contract for more than one year. *A priori*, it would seem that the first of these would have the least restrictive effect and the third would be most restrictive. The longer the term of the contract, the less frequent are the opportunities of competitors to bid for the buyer's trade. Long-term contracts with staggered maturity dates may be sufficient to forestall new entrants or slow

the rate of growth of small rivals, even if the latter are equipped to provide a better service at lower cost. In the recent metal container cases, contract periods of up to twenty years were reported.[9]

However, this conclusion must be modified slightly to consider industry practice. If the customary purchasing period in an industry is one year, as it is in most sectors of the food canning industry, then a one-year contract will not impose any real barrier to entry. If buyers customarily purchase their seasonal requirements as a unit, then the season defines a reasonable contract term. If, however, the industry is such that there is no customary purchasing period, then even short-term contracts may impose some barriers to entry. In this situation, long-term contracts cover not only the current period but subsequent planning intervals as well, thus foreclosing competitors from future as well as present sales.

For most products there is no clearly defined order period. Purchases are a continuous process; subject to fluctuations in inventory or production requirements, the supply of goods is provided in a steady flow which may be interrupted in order to change suppliers at any time. In retailing, this may involve transitional losses due to the need to dispose of old stock quickly; these losses will ordinarily vary directly with the size and speed of turnover of the inventory and will also depend on the nature of the outlet. That is, a single-line outlet such as a shoe store might have to sell all its inventory before adopting the new line, whereas a department store which is not so completely identified with a single brand might be able to liquidate its old inventory while gradually building up sales of the new line. Gasoline retailers, with an inventory which has a relatively high turnover, can make the change with comparative ease. Food packers, who customarily end the contract period with no container inventory at all, need absorb no transfer costs.

In the case of producers' goods, the absence of established consumer preferences for particular brands of components of the finished product reduces the barriers to change stemming from this source. That is, it is doubtful if consumer brand preferences would carry much weight with General Motors in consideration of a possible change from one brand of carburetor to another. This is not to imply that the purchaser of parts for further processing or for inclusion in a manufactured product can always change suppliers without friction. Questions of quality control, specifications, and inventory levels still must be answered, but consumer brand preferences for the raw materials or intermediate goods seldom enter in. It might be remarked parenthetically that a great deal of advertising may be

[9] United States v. American Can Company, op. cit.

devoted primarily to securing such brand preferences — the advertising of the 'Sanforizing' process for cotton garments and of marine engines are two cases in point.

Apart from these important fringe problems of inventory policy and brand preferences, the customary purchasing period for most products may be held identical with the individual order, so that any requirements contract on these goods would meet our third condition necessary for exclusion. However, the length of the standard order period becomes of significance in the case of buyers whose needs are seasonal in nature. For these, the customary purchasing period may be a season; there may be one season a year, as in the case of processors of most agricultural produce, or three or four, as in the case of women's clothing. In such cases it is conceivable that a contract for the season would have no more restrictive effect than a single order in other industries. But a system of contracts whose terms cover several seasons may have a restrictive effect if the other two necessary conditions are met.

Inasmuch as it might be difficult to make a definitive statement as to the planning period in any particular industry, it would probably be safe to say that any requirements contract for a duration longer than one year meets our third condition for exclusionary power inasmuch as few firms set up operating schedules for more than a year in advance. More distant projections, such as five-year plans, are necessarily tentative in nature and are generally for the purpose of providing a rough guide to financial, price, inventory and personnel policies and not for the actual scheduling of the flow of goods through the firm's plants or over the counter.

EXCLUSIVE DEALERSHIPS

In some markets it is a widespread industry practice to require dealers to enter into requirements contracts for certain goods, in return for which the dealer is granted an exclusive territory in which to exploit his 'franchise'. This reciprocal relationship may be called an exclusive dealership and as such is a different practice from a simple system of requirements contracts.

Just as one requirements contract is almost never sufficient to exclude competitors from any significant sector of the market, so also the exclusive dealership will seldom have any material restrictive effects, even though the seller otherwise may have the power to exclude. The granting of an exclusive franchise to a dealer implies (a) that there are alternative outlets available, and (b) that the seller's policy is to leave these other outlets to competitors. A requirements contract, unaccompanied by an exclusive territory

clause, is not restricted in this fashion. There is nothing in the contract to preclude the seller from trying to obtain the trade of *all* the dealers or distributors in a given market area. The only limits imposed on his ability to do so are those raised by the existence of vigorous, effective competition — that is, the absence of the power to exclude. Presumably, this competition exists whenever an exclusive dealership contract is signed; otherwise the seller would have no incentive to make such an agreement.

If exclusive area clauses are included, requirements contracts may provide some assistance to small business through grants of limited space monopolies and may increase dealer efficiency through the seller's use of the threat of non-renewal of short-term contracts to force effective marketing. In addition, the exclusive territory provision implies that the manufacturer will not sell through other outlets in the area, thus leaving these open to competing sellers; therefore, the preemptive effect of an unrestricted requirements contract is materially reduced.

Only in small, isolated markets would the number of satisfactory outlets be limited to one, thus rendering a single requirements contract restrictive of competition. Here the seller might be willing to grant an exclusive franchise for form's sake, but the result would be the same with or without this clause. Therefore we may conclude that, when the requirements contract embodies an exclusive territory clause, competition is not foreclosed by the seller's contracts, regardless of his market position or the term of the agreements. Only in the unlikely case that the number of outlets is limited by some external factor to one to each market area can such contracts be harmful.

OUTPUT CONTRACTS

Output contracts are the inverse of requirements contracts and the analysis of the latter can be applied to the former. An output contract may be defined as an agreement by the seller to sell all his output to a particular buyer over a specified period of time. This means that competing buyers are foreclosed from one potential source of supply.

In its extreme form, an agreement of this type amounts to vertical integration. That is, if the output contract is combined with a requirements contract, the arrangement is the same as if the two firms were merged. The only difference lies in the permanence and legal form of the relationship between buyer and seller. For this reason, and because most sellers prefer not to be entirely dependent on one sales outlet, this type of agreement is relatively rare.

When it does occur, however, the output contract may be a means of restricting competition. It can do so only if the seller has (or a group of sellers have) a persistent monopoly position, either through patents and technological superiority or through control over raw materials supply. Unless this is the case, competing buyers will have satisfactory alternative sources of supply.

What do we mean by a 'persistent monopoly position'? Extending the analysis above to conform to the output contract case, we can say that absorbing the output of one seller (or a group of sellers) will impose disproportionate competitive handicaps on rival buyers only if (a) there are sizeable financial, marketing or technological barriers to the development of competing sellers, and (b) the term of the contract is longer than the customary purchasing period in the industry. For example, if a tomato canner signs up all the tomato growers in a given crop area, other canners will be unable to operate without importing tomatoes from outside at prohibitive cost. Or, if retail buyers of bicycles insist upon a certain brand of brakes and will accept none other, preemption by one bicycle maker of the output of the manufacturer of this brake will tend to exclude other bicycle makers from the market. Similarly, if a controls manufacturer makes a control which is essential to the proper operation of a servo mechanism, the preemption of his output by one buyer will tend to clear the field of all rival purchasers.

These illustrations are extreme, but the few actual cases which have come to light are roughly similar. This modern-day counterpart of the nineteenth century financial coups in the grain and gold markets is relatively infrequent and seldom spectacular. This brief outline should serve to indicate how to tell when an output contract or series of contracts will have a serious restrictive effect on competition.

CONCLUSIONS

Requirements contracts fall within the purview of Section 3 of the Clayton Act. Not all such agreements are in violation of the statute, but only those which produce a 'substantial lessening of competition'. It is the purpose of this paper to determine the conditions under which this will result.

A single requirements contract, in itself, would be highly unlikely to have this effect. A possible exception would be a bilateral monopoly situation in which the existence of competition among sellers would react primarily to the advantage of the monopolistic buyer rather than to the economy as a whole. If requirements contracts are accompanied by exclusive territory clauses, little exclusionary effect is likely to be felt. Furthermore, the requirements

contract will not be particularly restrictive if it is not part of a general system of such contracts and if the seller is equally willing to sell on a non-requirements basis.

A system of requirements contracts selling, however, rigidly enforced and adhered to by the seller, could be a means of implementing the power to exclude. Possession of this power is the first prerequisite of an economically restrictive use of requirements contracts. The power to exclude is provided either by great and permanent cost advantages, disparities in financial strength, or low cross-elasticity of demand. The first two of these can be present in a market for a homogeneous product. In such a market, requirements contracts cannot be used effectively to gain market share — the availability of comparable substitutes for the seller's product at comparable prices precludes the existence of most incentives to buyers to enter into these agreements. The requirements contract may be used in this situation, however, to maintain a market position already won. By preempting all the outlets available to potential new entrants, an effective barrier to entry may be raised.

Requirements contracts may be a means of increasing an already large market share only in markets for differentiated products. These agreements will tend to achieve this result when three conditions are present:

1. *Strong initial market power.* A large gap in the chain of substitutes, evidenced by low cross-elasticity of demand and high market share, will provide a seller with a lever with which to induce buyers to deal exclusively.

2. *Limitation on the number of outlets.* If the number of outlets is effectively limited by custom, financial or technological barriers, preemption of these outlets will render precarious the chance for survival of small firms or new entrants. On the other hand, market power will be ineffective if the foreclosing of existing or customary outlets merely results in the development of new and satisfactory channels of distribution.

3. *Excessive term of the contract.* When the customary purchasing period is roughly equivalent to the individual order, the first two conditions are both necessary and sufficient to the effective exclusionary use of a system of requirements contracts. When the customary purchasing period is a season or a year, contracts for this period only are no more exclusionary than an individual sale contract. Thus the third necessary condition is a contract period which is considerably longer than the customary purchasing period in the market.

The collective use of requirements contracts by a group of

oligopolistic sellers will also tend to restrict competition if the second and third conditions are met. Single firm monopoly is not essential. Even in the absence of overt collusion, control of the limited number of satisfactory outlets by the dominant group can raise effective barriers to entry.

Therefore, public policy in the antitrust field should be restricted to firms which meet the conditions outlined in this paper. Use of requirements contracts by a firm which lacks the power to exclude is not restrictive of competition and should not be held in violation of the statutes. Output contracts should be analyzed by the same type of reasoning. The remedies invoked in either case should be aimed at removing one or more of the three preconditions discussed. Only if the number of market outlets is effectively limited and the customary purchasing period is the individual order should the seller be enjoined from the use of any form of requirements contract.

YONKERS, NEW YORK

PUBLICATIONS RECEIVED

The American Economic Review, Vol. XLIII, No. 3, June 1953, No. 4, September 1953, with Supplement on 'Graduate Education in Economics' by Howard R. Bowen, and No. 5, December 1953.

Business Research at U.C.L.A., a Summary of Research Publications by the Faculty of the School of Business Administration, University of California, Los Angeles, July 1st, 1948-December 31st, 1952.

The Controller, U.S.A., July, August, September, October, November and December 1953, January, February, March and April 1954.

The Cost Accountant, London, Vol. 32, Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, July, August, September, October, November and December 1953, January, February, March and April 1954.

Economisk Tidskrift, Vol. LV, No. 3, September 1953, and No. 4, December 1953.

Employee Remuneration and Incentives, the Institute of Cost and Works Accountants Ltd., 1954, 7s. 6d.

Explorations in Entrepreneurial History, Research Center in Entrepreneurial History, Harvard University, Vol. V, No. 4, May 1953, Vol. VI, No. 1, October 1953, No. 2, December 1953, and No. 3, February 1954.

Industrial Efficiency, by M. C. Munshi, Vora & Co., Bombay, 1953.

An Introduction to the Study of Industrial Relations, by J. Henry Richardson, George Allen & Unwin Ltd., 1954, 30s.

Journal of African Administration, Vol. V, No. 4, October 1953, with a special supplement on 'Judicial Advisers' Conference 1953'.

Journal of the American Statistical Association, Vol. 48, No. 262, June 1953, No. 263, September 1953, and No. 264, December 1953.

The Journal of the Glasgow and West of Scotland Commercial College, Vol. 3, No. 1, February 1954.

The Management Review, American Management Association, July, August, September, October, November, December 1953, January and February 1954.

The Quarterly Journal of Economics, Vol. LXVII, No. 3, August 1953, No. 4, November 1953, and Vol. LXVIII, No. 1, February 1954.

Social and Economic Studies, Institute of Social and Economic Research, University College of the West Indies, Vol. 1, No. 2, June 1953.

Statistics for the Cost Accountant, by J. A. Reece, Occasional Paper No. 1, the Institute of Cost and Works Accountants Ltd., 1954, 5s.

Transport Costing, published for a Joint Committee of the Institute of Municipal Treasurers and Accountants (Incorporated) and the Institute of Cost and Works Accountants, November 1953.

World Population and Production, Trends and Outlook, by W. S. Woytinsky and E. S. Woytinsky, the Twentieth Century Fund, 1953, 12$.

SCHACHTIAN MERCANTILISM

by N. I. Momtchiloff

I

Multilateral trade as it existed before the era of exchange controls and import quotas has been a brief episode in the history of world trade. It lasted just about three score and ten years, from the late 1860s to 1930. Free imports into Great Britain and continuous British investment abroad were its mainstays. As one of the heavy casualties of the first world war it was nursed into rather precarious restoration by America's foreign lending, until it died shortly before its twin brother the gold standard.

Since there was no new system of international trade and payments to take over where multilateral trade had left off, a return to mercantilism was perhaps inevitable. International lending and investment were replaced by universal flight into gold: the memorable urge for liquidity. For a large number of countries the only way to avoid open bankruptcy on international account was to cut their outgoings in foreign exchange by drastic and extensive government controls. Under the pressure of growing unemployment the principal aim of economic policy shifted from mere accumulation of gold reserves to promoting and subsidizing exports in order to prevent further falls in employment.

Exchange control was but one branch of the spreading tree of regulations, safeguards and incentives under which production, employment and foreign trade were to shelter from the impact of the world-wide slump. The famous 'interplay of economic forces', thoroughly discredited, was to be regulated in the future by the national governments so as to produce the greatest '*national* advantage and *relative* strength' (Keynes's own words and italics, in his 'Notes on Mercantilism', *The General Theory of Employment, Interest and Money*). 'National' against 'multilateral' was the new trend of economic thinking that was gaining ground steadily in the years after the collapse of the nineteenth-century system.

The foremost theoretical exponent of this new teaching was Keynes; but it was Dr. Schacht who provided the practical demonstration, three years before the consistent statement of the theory.

When Dr. Schacht took control of the Reichsbank, for the second time, in March 1933, Germany was insolvent on foreign account, and its home finances were in a desperate state. More than 6½ million Germans were unemployed and civil war threatened the country. Emergency measures were called for. They were taken

with two main purposes in view: to restore the balance on foreign account; and to provide work. The two tasks were closely interconnected, since more employment meant more raw materials, most of which had to be imported.

Schacht called a meeting of the foreign creditors, showed them the books — literally — and obtained a Standstill Agreement whereby payments on the foreign debt — with the exception of the Dawes and Young Loans — were in the future to be made in blocked marks. Frozen marks began to pile up at the Conversion Office set up for the purpose. Another of Dr. Schacht's earlier creations, the Golddiskont Bank, formed with British help in 1924 to save the mark, was now empowered to buy these blocked mark balances at about 50 per cent discount. In other words the Golddiskont Bank was selling to the foreign holders of mark balances in the Conversion Office foreign exchange at about twice the official rate. This exchange profit of some 50 per cent represented a 'saving' (in marks) which was openly and very effectively used for promoting Germany's exports through an elaborate system of subsidies and incentives.

Many of the foreign creditors got rid of their claims in this way. An extensive trade in blocked marks developed and, as the uses to which they could be put varied, a multitude of types of marks came into being: there were 'travel' (or 'tourist') marks, 'investment' marks, 'aski' marks, and many more categories of marks, exchanged at higher or lower rates according to the sacrifice the foreign owners of the mark balances were prepared to accept for getting their funds out of Germany. The device proved of considerable and lasting interest to many other countries also in foreign exchange difficulties; it is still in use.

Exchange control was introduced in Germany in July 1931, before Dr. Schacht's re-appointment at the Reichsbank. Some of the foreign creditors, unable to get their funds out of Germany, began in their turn to block the proceeds of German exports and to set off credits against debits. This opened the way to a new method of transfer and payments — the well-known 'exchange clearings'. Switzerland first, then France, Belgium, and the Netherlands, made a number of clearing agreements with Germany and other countries that had practically stopped transfers on foreign account. Dr. Schacht was a most vocal critic of the exchange clearing: as late as March 1935 he sharply attacked the method, which he blamed for the disappearance of Germany's credit balances of trade in Europe. Nevertheless, he considerably refined this expedient and eventually made of it one of the most effective methods of obtaining large supplies of foreign goods, particularly foodstuffs and raw materials,

against German exports. This was killing two birds with a single stone: Germany was saving foreign exchange while promoting her own exports. In the 1930s she was the principal large market for many countries' raw materials and agricultural products. This advantage she used to the full, imposing her own terms, including the exchange rate between the mark and her trading partners' currencies. Whenever possible the rate was fixed so as to overvalue the mark and to yield high returns, in depreciated money terms, to exporters selling to Germany. While the central banks concerned looked at these developments with growing alarm, politically strong vested interests were created in a number of agricultural countries and this broadened the road for the Reich's economic penetration in many markets. By September 1935, about 85 per cent of Germany's foreign trade was carried on barter lines. She had clearing agreements with twenty-five countries. But her earnings in dollars, pounds sterling and other free currencies remained far below what she urgently needed for the comprehensive drive against unemployment.

It was in this field of 'work-creation' (*Arbeitsbeschaffung*) that Schacht did his most significant work, not only from Germany's own angle, but as a practical test of the neo-mercantilist concepts of government action in a period of economic depression. In August 1934 he became Minister of National Economy. Combined with his presidency of the Reichsbank this new office gave him wide scope for originating plans, and considerable power for ensuring that they were carried out.

Funds for financing these employment-creating plans could not be raised by the Government through direct borrowing from the market: the credit of the State was at a very low ebb and investors were still smarting under their recent heavy losses on government bonds and other long-term securities. Direct advances by the Reichsbank were out of the question: the 1923 inflation was still fresh in everybody's memory. Dr. Schacht produced a new device which fitted this state of things. A special company, *Metall-Forschungs A.G.* (*MEFO*) was formed by four of the largest industrial concerns — Siemens, Gutehoffnungshütte, Krupp, and Rheinstahl. All financial commitments of the company were guaranteed by the Government direct. Contractors for supplies to the Government were authorized to draw bills on Mefo, and the Reichsbank undertook to buy these bills without restriction. Owing to the general stagnation of business, there was plenty of idle money in the banks and in industrial firms who distrusted long-term securities but were quite willing to invest in Mefo-bills, at 4 per cent p.a., since these bills could be turned into hard cash at any time.

This did the trick. Within the next four years about 12 billion marks of Mefo-bills were issued, and the market took up six billion worth of them. They became the favourite investment for short-term bank money and, as the Reichsbank's own holding of commercial bills had been heavily depleted by the slump, there was ample room for absorption of Mefo paper without immediate inflationary effects. Inflation was also forestalled by the rapid increase in industrial production and employment, accompanied by a steady improvement in the supplies of food and consumer goods through the successful working of the barter agreements.

The integration of Germany's foreign trade with the work-creation programme was completed through the 'New Plan' which came into force in September 1934. All imports were closely adjusted by quotas to the planned exports as determined in the various bilateral agreements and as directed by the extensive system of inducements, subsidies and differential rates of exchange. The centralized management of the vast and intricate network of control offices was ensured by enlisting the services of a large number of banking, administrative, technical and legal staff.

The Plan worked. But its very success, and the ruthless efficiency with which Dr. Schacht was running the system, brought him into repeated clashes with prominent members of the Nazi party, eventually with Hitler himself. The unending, economically unjustified demands for foreign exchange could not be met in the longer run without throwing the balance of payments and the New Plan itself out of gear. Reluctantly Schacht had to give in and, in April 1936, the distribution and allocation of foreign exchange came under Goering's personal control. A few months later, the famous Four-Year Plan, also under Goering's direction, put an end to the actual power in Dr. Schacht's hands. His resignation from the Ministry of National Economy in October 1937 and dismissal from the Reichsbank in January 1939 were the formal confirmation of this fact.

II

There can be no doubt that Dr. Schacht's policy gave tangible results as long as he was in control of Germany's economy. Within less than three years unemployment was eliminated, the public finances and balance of payments very substantially improved. The impetus given by the work-creation schemes was reinforced and widened through the rapid progress of rearmament and lavish spending by Hitler's government. A clear dividing line is hard to draw between the effects of Schacht's New Plan and those of Ger-

many's preparation for war. Vast projects like the extensive motor roads (*Autobahnen*) and some other public works schemes served both purposes and, in the general buoyancy of the German economy since 1934, imponderables like mass response to party slogans and propaganda must have played a part that cannot be left out of account.

In Schacht's own admission his economic policy was destroyed by Hitler's crazy plans for war and conquest.[1] But the Schachtian system was kept in use, as applied to government controls and centralized direction of production, credit and foreign trade. Immensely strengthened by military success in the first three years of the war, Germany embarked on an ambitious policy of integrating economically the major part of Continental Europe into the framework of the New Order. Even countries like Sweden and Switzerland, which escaped political domination, had to comply with certain requests for credits and supplies, and to put up with many accomplished facts. Bilateral agreements on trade and payments were in operation throughout the Continent. Germany even tried — without much persistence — to establish some interconnection between the bilateral agreements through a central clearing office in Berlin, but this attempt failed.

As the war was swallowing more and more of the Reich's industrial output while important raw materials unobtainable in Europe remained scarce, the flow of German exports in payment for supplies from abroad was drying up. The suppliers' credit balances in Berlin were steadily rising and towards the end of the war reached enormous totals. As there was no adequate return flow of imports to the countries exporting to Germany, scarcity of manufactured goods and industrial materials in these countries quickened the progress of inflation generated by the piling up of the proceeds of unrequited exports.

Wartime conditions of production, distribution and labour recruitment brought about an increase and tightening of government controls over the whole economic life, not only in belligerent countries, but in those spared by the war. In devising and applying these controls, governments took many a leaf out of Dr. Schacht's book. Exchange restrictions, import quotas, bilateral trading and re-direction of exports, led to extensive direct trading by government departments. Pre-emption (i.e. buying a foreign country's exportable goods to prevent the enemy from getting hold of them) was a corollary to the Schachtian trading methods. It was used on a large

[1] See his autobiography, *Sechsundsiebzig Jahre Meines Lebens*, published by Kindler und Schiermeyer, Bad Woerishofen, 1953.

scale by Germany, some of her satellites, and also by Britain and the U.S.A. Freezing of foreign balances, use of multiple currencies, export subsidies, and some other Schachtian devices found considerable favour with government officials and their advisers in Britain, the U.S.A., Scandinavia, and in many South American countries, where they remained in application after the excuse of wartime necessity had disappeared.

Politicians — and some politically minded economists — were quick to grasp the wider implications of Schachtian economics and the scope they offered for fulfilling the tenets of the new doctrine that was to replace the discredited system of free enterprise. The universally accepted objectives of 'full employment in the welfare State' provided potent inducements to maintain some of the wartime expedients which had proved their worth as instruments of political action, both at home and abroad. In Britain, America, Sweden, France and elsewhere some of Dr. Schacht's disciples were influential people; and not all of them were socialists. The post-war brand of mercantilism offered a good deal of common ground on which modern socialism and diehard capitalism could see eye to eye and work on parallel lines. This probably accounts in part for the slow headway made so far by international attempts at reviving multilateral trade and payments after the war.

III

What, in the long run, is likely to survive of Dr. Schacht's discoveries? — Probably more than one would like to admit. There are strong reasons why this might be so. To quote a source quite above suspicion of Schachtian bias (*The Network of World Trade*, published by the League of Nations in 1942): 'Normally, about 70 per cent of all trade in merchandise is 'bilateral', representing imports offset by exports in trade among individual countries. A share — probably rather small — of the remaining 30 per cent is also bilateral, in particular import surpluses representing yield of foreign investment and derived from the countries in which the investments are located: no third country then partakes in the transfer of this yield. This kind of bilateral trade increased during the 'thirties. Triangular or multilateral trade may have represented about 25 per cent of all merchandise transactions during the 'twenties' (page 87).

The momentous changes in the world's political geography and currents of trade since the above lines were written seem to point to further shrinking of truly multilateral trade and payments. The

Communist Area emerged from the conflict immensely larger than it was before. Absolute State control is a basic principle of economic policy for that area. All its members are pledged to maximum self-sufficiency. For the time being, all of them except Russia suffer from acute and lasting scarcity of goods obtainable outside the area, and cannot earn enough foreign exchange to pay for them. In the nearer future their imports will have to be severely restricted and their exports carefully directed, very much on Schachtian lines. In the longer run the Communist Area will probably increase its self-sufficiency (as an area). The prospects of its re-entering the circle of multilateral trade will decrease still further.

There should be no ideological bias towards autarky in the Sterling Area. But the war left it in a state offering both scope and justification for Schachtian techniques, particularly in its balance of payments with the rest of the world.

Although the number of politically independent members has increased since the war and will be growing still further, the very nature and distribution of its physical resources and capital formation is likely to make it more rather than less dependent on trade within the area, unless the North American markets and those of Continental Europe provide expanding outlets for Sterling Area exports to an extent considerably above any experience of the last fifty years. The existence of large sterling balances in London — and this is likely to be a permanent feature of the trade and payments framework of the area — will remain a strong inducement to trade with Britain and other members. And in the case of dependent territories it can be argued that their foreign trade and the long-term financing of their development may yield better results if they are co-ordinated on the basis of programmes worked out in London.

It is true in every sense of the term that trading within the Sterling Area is multilateral: this is probably the largest present area where multilateral trade is a going concern. But taken as an area, this group of countries has to use exchange control and mutually agreed management of imports, exports and foreign payments so as to keep its combined balance of payments in working order. The techniques applied to these complex and delicately adjusted tasks still show more than one Schachtian feature. But sensible handling of the major issues and a good deal of give-and-take have smoothed away most of the rough edges in these devices.

Exchange controls in one form or another are still in force in Continental Europe. Government direction of foreign trade, by quotas, subsidies, tax allowances and complex regulations, is still very much in use. And the European Payments Union may,

technically at least, be considered as a recognition of the exchange clearing principle of setting off credits against debits and transferring the final balances only. The Union has achieved results that neither Schacht nor his successors in Germany ever came near achieving: the settlement of debts by a clearing between a large number of politically independent countries. But it has not solved the problem of providing foreign means of payment to members beyond the limit of their actual earnings on international account. That problem cannot be solved by Schachtian methods.

Americans would resent any suggestion that they too have been following in Dr. Schacht's steps. Yet they have. Stubborn attachment to a fixed exchange parity was one of the most advertised principles of Schacht's policy in matters of currency and economic planning in general. Protection of home industry and agriculture was not invented by Dr. Schacht: others, before him, had done much more in this field for much longer than he. *Vixere fortes ante Agamemnona* . . . But he added to the old, rusty armoury and brought some of the weapons to a much higher degree of efficiency. Few have beaten him at the subtle game of promoting exports with creditors' money or by gearing foreign trade to a centrally managed double drive of economic expansion and rearmament. As to stockpiling, Dr. Schacht can claim full credit for showing the rest of us how it can be done without harm to home production, trade and finances. Harnessing bank credit to work-creation schemes was for the first time successfully demonstrated under the New Plan. Few imitators have gone as far, but the doctrine is firmly established. It has been practised in the United States quite recently, and is likely to be used in the future, there and elsewhere.

Dr. Schacht was right in proclaiming, perhaps rather too emphatically at that time, that he was destroying classical economics and finding new ways of helping industry and trade, better and more efficient ways than savings and multilateral trading. He remains unrepentant to this day. But his experiment was not given a final trial under peacetime conditions. That trial has been proceeding elsewhere in the last three or four years, since shortages of goods receded into the past and some controls were relaxed or made more flexible.

It is too early to draw final conclusions on the outcome of these trials while currencies remain inconvertible, imports regulated by quotas, and at least twenty countries still trade by bilateral agreements (at the height of the New Plan Germany had twenty-five such agreements). True enough, a trend of opinion away from bilateralism and in favour of convertibility is clearly gaining ground,

particularly in Germany and Great Britain. It remains to be seen what real scope there is, in the economic world of our time, for multilateral trade, and whether convertibility without some degree of Schachtian controls is a practical proposition. Still more important, no method has yet been devised for ensuring high employment in a recession without extensive and centrally co-ordinated measures of import restrictions, export incentives, and higher spending and investment.

The economic policy of the near future may well be a mixture of Keynesian and Schachtian mercantilism with a multilateral label on it.

LONDON

THE PRICING OF BOOKS

by RICHARD BLACKWELL

INTRODUCTION

THE book trade divides into three main sections — printing and binding, publishing and bookselling. These activities are, as a general rule, carried on by separate specialist businesses. Occasionally a business may grow vertically, until it carries on two or even all three activities itself (though there is some risk, when book manufacturing and publishing are combined, of the cart driving the horse). My own experience (such as it is) has been in a firm that started as bookseller, has developed into the field of publishing, binds for itself, but has its printing done for it on commission. B. H. Blackwell Ltd. had been selling books for forty-three years when Basil Blackwell publisher was incorporated in 1922 to do something more than the traditional bookseller's publishing of prize essays and books of local interest. It specialized mainly in children's books and school text-books, with some English literature and *belles lettres*. The main growth, however, has been during and since the recent war, chiefly in the publishing of scholarly works in the fields of economics, philosophy, politics, history and other subjects of study at the universities. This article deals primarily with the problems of such specialist publishing and is based on experience of only part of the publishing trade. My firm (one of the very few of any account to survive outside London), has little or no part in the greater rivalries, risks and rewards of publishing popular general books (fiction, biography, travel, etc.) for which an office in the capital is essential. We are content with producing books whose sales will be less substantial but the market for which is distinct and (if they are of the right quality) reasonably well assured.

Basil Blackwell is now a medium-sized publisher, typical of an industry which is small scale and where the businesses, even though public companies, are family-controlled. Its only unusual feature is its connection with a bookshop. The books in its lists, as in the case of other publishers, largely reflect the interests of the directors of the firm. As a publisher it is dependent on the printing and binding industries for its costs of production, and on the booksellers for its sales. Booksellers are subject to the Net Book Agreement, a system of resale price maintenance operated with the full support of the publishers to prevent competition over discounts which experience has shown to be injurious to the trade as a whole. Its effect is

that publishers issue books at net prices and do their price calculations in terms of this final retail price.

The British bookseller expects (but does not always get) a discount of 33⅓ per cent off the net price. For this he is expected to take the risk of ordering a book when the publisher's traveller calls on him in advance of publication, or to stock thereafter a certain number of copies. If he refuses to hold stock and re-orders in single copies, the publisher will generally grant only 25 per cent discount for part of the retailer's function is then being borne by the publisher. Many books of an educational nature only carry 25 per cent discount or less. (A bookseller can in fact count himself fortunate if he achieves an overall gross profit of 25 per cent.) Wholesalers enjoy a discount of some 40 per cent. Copies sold for export carry an even greater discount. Our general export agent is granted 45 per cent, of which he will pass on 30 per cent to the bookseller abroad. The latter will usually add a mark-up on his own account and in the case of Commonwealth countries this will be substantial, according to a locally agreed schedule — a 21s. book for example, supplied at 14s., being sold for 28s. sterling. This is an ill wind for the local customer which often blows good for the English bookseller, who can supply at the much lower English net price. An American importer of any quantity of a title will expect a discount of at least 50 per cent, and will in turn fix a selling price 50 per cent or more above the English selling price. Nine of the best-known publishers recently provided figures for their latest year's trading in new fiction and general books: and these showed the granting of an average discount off the English net price of 39.07 per cent on total sales.

COSTS

Costs must be divided into those that can be charged against a particular book and those that are general to the publisher's business.

General overheads (to take these first) vary to some extent with the size of the house, its location and the type of book in which it specializes, but they are generally speaking heavy, as the amount of detailed work involved in publishing is disproportionately high. The accountant of the Publishers' Association has recently estimated that a firm could not survive in independence under present conditions with a turnover of less than £50,000. It remains true, however, that publishing is a relatively small-scale industry, and beyond this critical minimum size there are not many economies of scale. A publisher needs to be large enough to buy his paper at the best price from the mills or agents (although after a relatively small

quantity the saving is not great), and it is an advantage to him if his turnover is large enough for him to employ his own travellers, instead of having to share representatives with other firms. The costs of printing and binding are, however, related to the book and size of the edition, and not to the size of the publisher: and his overhead costs, once the minimum scale of turnover has been reached, if they decline, will do so at a very much diminished rate. Thus a relatively small publisher has few disadvantages of scale, and there will be positive advantages in the direct personal attention which the principals will be able to give to problems which a larger publisher would have to delegate to departmental heads. Publishing is a trade in which personal relationships are supremely important. The figures provided by the nine publishers mentioned above gave average overheads as 17.20 per cent of the published prices, or (allowing for the discount) about 24 per cent of turnover. Our overheads are on the average some 2-3 per cent lower.

Another type of cost which is attributable to a particular book, but is not generally taken into account in fixing prices, is the payment of the author. Though he may be offered some form of profit-sharing contract, he usually takes a royalty on some such sliding scale as 10 per cent of the net published price up to 2500-3000 copies, 12½ per cent up to 5000, and 15 per cent thereafter. A few best-selling authors will start at 15 per cent or even more. An unduly high rate of royalty may affect the price of a book, as the publisher in order to give himself enough margin to pay the author may be forced to raise the selling price, even though this step will itself increase the royalty payable.

The production costs that are charged against a particular book must be divided into those that fall on each copy printed, and those that vary with the size of the edition. I shall take as an example (as the figures are convenient and the book points a price-fixing moral) a title that I published some four years ago, which we will call *The Manufacture of Trade Cycles*, a work of 400 pages of interest to economists and industrialists. Of this an edition of 2000 copies was printed. The costs of manufacture were as follows:

		£
I. Costs varying per copy with the size of the edition	Composition and correction of type	380
	Printing of the first 1000 copies (which includes initial charges for making ready the machines)	85
	Blocks for illustrations and jacket	60

II.	Invariable costs per copy printed	Printing second 1000 copies (run-on price per 1000)	30
		Paper (2s. 1d. a copy)	210
		Binding (2s. a copy)	200

With the addition of other small items, the total cost of production was almost exactly £1000, or 10s. a copy. If 2500 had been printed, with no change to the costs in section I and proportionate increases in the costs in section II, the cost per copy would have been reduced to 8s. 9d. (Production costs may be said to fall significantly up to an edition of 10,000. Beyond that point the saving becomes of less importance. An exception is the cheap paper-covered edition which is produced on a machine which both prints and binds, and which requires, to be economical, a minimum run of 50,000. Thus Penguins, for example, started with the fact that, in order to get down to the pre-war price of 6d., they could only publish titles with a minimum estimated sale of 50,000.)

The first impression of *The Manufacture of Trade Cycles* sold out rapidly, and a further small impression of 750 was printed. The cost of these copies (even though the first binding order was for only 250 copies, and the charge was therefore 2s. 3d.) was no more than 8s.

PRICES

The publishing trade in general follows, in the case of most categories of books, the same simple principle in fixing prices. This is to multiply the cost of manufacture by about 3½, rounding up to a conventional price; if for example the figure after multiplication is 14s. 8d., the price fixed will be 15s. Chapter III, page 53 of Sir Stanley Unwin's *The Truth About Publishing* (1946 edition), states: 'If a publication is to be economically self-supporting the published price must usually be fixed at between three and three and a half times the cost of production.' Since 1946 there has been a sharp rise in the cost of overheads, and I understand that in the next edition of this standard work the author will come down more definitely in favour of the latter figure. The statistics for the nine publishers mentioned earlier show the average cost of their books as 28.24 per cent of the published price, which represents a multiplication by almost exactly 3½. Inspection of a bookseller's stock shows a broad uniformity of price for books of the same type.

The cost of a book does, however, as we have seen depend very largely on the size of the edition printed. The size of the edition depends on the estimate of sales. The estimate of sales appears at first sight to depend on the selling price — particularly to authors,

who often argue that their sales would be greater if only the publisher would reduce his price. The publisher, therefore, seems to be caught in a vicious circle. But the market does not in fact have the elasticity which most authors and economists assume — particularly for the type of book that we publish. It is very doubtful if price reductions have a proportionate effect on sales unless they are so drastic as to reduce books to bargain levels, like remainders or Penguins. What can be said with certainty is that if the public want a book they will buy it at a price that seems to them fair, but if they do not, they will not be tempted by comparative cheapness.

If the publisher yields to the temptation to increase his printing order and to lower his selling price accordingly, in the hope of greater sales than those estimated by his first cautious conjecture, he is likely to be in trouble. There are exceptions to this rule, and one example from my own firm was the production in 1934 of the Shakespeare Head Press one-volume edition of the complete works of Shakespeare. This was intended to compete with the book bargains being offered at that time by newspapers, and to be competitive had to be sold at 6s. The printing order was deliberately made 50,000, the minimum number to make this price practicable: and the gamble came off. This is, however, the sort of exception to prove the rule, just as there is but one Shakespeare; and the success of this book bears out the statement above, that price reduction is only a compelling factor in sales when it is drastic.

The skill of a publisher lies in gauging the demand for a title. This can only be acquired by experience of the sales of similar publications. It is also one of the reasons why publishers specialize. Many books do, however, sort themselves into classes the demand for which can be estimated with fair ease and accuracy. There is a comparatively narrow bracket between the upper and lower limits of demand, which in turn limits the possible variations in price: and the market will be fairly constant within that range. The sort of scholarly work that we publish is reasonably sure to sell the 2000 copies that make it an economic proposition. In the case of *The Manufacture of Trade Cycles* the estimated sales were 2000-2500. Prices fixed on either basis would have been reasonable: and my mistake in choosing the lower bracket was not serious, as the necessary number could be reprinted at, or in fact below, the original cost. A more serious error was in fixing the price at 30s., on a cost of 10s. Like, presumably, many other firms we clung longer than was economically prudent to the pre-war practice of multiplying costs by three, and this was the figure I proposed to the author, saying that the book nevertheless looked worth 35s., and that this

should be a safe price as many of the sales would be to institutional or official buyers. The author was of the opposite opinion, maintaining that the extra 5s. would deter every potential private customer! The proceeds of the sales of the first edition were £1587 (1111 copies were sold inland at an estimated 20s. apiece: 500 copies were sold to an American publisher at 12s., and 204 copies were sold through our general export agent at 16s. 6d. An overgenerous policy over free and review copies accounted for the remainder of the edition). The profit was £524, of which the author, as he was on a profit-sharing agreement, took half. My share of £262 was not enough to cover all my overheads, which are more than 20 per cent of turnover. The second impression has just about sold enough copies to cover production costs, and is now selling some 50 copies a year. It is clear that on an edition of 2000 the price should have been 35s. (the extra 5s. would have added 50 per cent to our combined profits), and most unlikely that this would have made any significant difference to the sales, particularly as upwards of half of these in the event were to scholarly, public or industrial libraries.

It is such institutional buyers, and others that can charge their purchases to expenses, that publishers of scholarly books have much in mind, while authors visualize impecunious students. No publisher wishes to exploit the latter, but it is easy to exaggerate the extent of their purchases (and to forget that half of their expenditure is recoverable on the second-hand market). Students rarely buy more than the few essential and prescribed books: and these they will buy irrespective of price. Thus the sales of, for example, Samuelson's *Foundations of Economic Analysis* remained constant in spite of the increases in price forced by inflation. Let it not, however, be thought that the publisher of a book such as this, which is aimed at the student market, will not keep his price as low as he can afford. If he does not, someone else may undercut him.

It is perhaps relevant here to say that many people are misinformed about the extent to which costs (and therefore prices) can be reduced by economizing in binding charges and using paper covers. If a book costs 1s. 6d. to bind in cloth, it would cost 6d. to bind in paper, which would mean a reduction of 3s. 6d. in the selling price. This is not a sufficient saving to overcome the antagonism of the public in general, and librarians in particular, to paper-covered books. Publishers have made all possible economies in book production, by increasing type areas on the page, reducing the weight of paper used and binding where possible in imitation cloth: and these measures have helped to keep prices down. It remains, how-

ever, true that the processes involved in the manufacture of a book are too many and complex, and technological advances that would simplify and reduce them would be a great boon to publishers.

If the publisher has estimated the sales of a book exactly, he will sell all the copies that he has printed: and he will be content if he sells half the edition quickly and recovers his outlay, and sells the remaining copies more slowly. If he has been over-optimistic, he can only sell his overstocks to the remainder merchant, for a third of his cost, and then only if they have a popular appeal. He can, however, reduce his risk to some extent by binding his printed sheets in batches as he needs them. If he sells out his whole edition and receives further orders, he will, if he is wise, consider carefully whether the demand is temporary, and can be met by second-hand copies or by offering to take back from the trade unsold new copies, or whether a reprint is necessary. He hopes for the latter because, as we have seen, his rate of profit is higher than on the original edition, though the rate of royalty paid is probably higher: but it is easy to reprint in haste and repent at leisure. One book, for example, that we published at the author's expense sold out the printing of 1500 in three months. Against our advice, she insisted on having it reprinted at once, and twenty years later, having reprinted 1500, we still had 1500 in stock. Again, a few years ago we published a book on economics for which we decided the edition should be 2000. The printer unfortunately printed short by 100 copies, and the edition sold out quickly. We reprinted 750 and still have 700 in stock. It is often wise to let a book stay out of print for some months or years, to allow the demand to build up or refresh itself: and the book can then with safety be reprinted.

There are classes of books that are exceptions to the general pricing principle stated at the beginning of this section. These are in the main books that have to conform to a special or competitive price. School text-books are the type with which we are most concerned, the prices of which must be within the exiguous allowances granted to teachers by education committees. These, if they establish themselves successfully, will sell for a good number of years, and the constant reprints will in the end yield the publisher his profit: but he will probably face a loss on the first edition. We recently brought out a new geography primer which on a first edition of 17,500 made a loss. It will start to make a profit after we have sold 23,000. The principle holds good for other classes of text-books, where the publisher can hope to make up on reprints for a slender profit on his first edition.

Reprints of the classics are another line where margins are likely

to be fine. These, being out of copyright, are subject to a competition that does not affect more modern works. They come generally from publishers with their own printing works, where they can be put through in slack times to keep factories running at an even rate of production. Here again constant reprints may compensate for a slender rate of profit. As the margin is fine, any attempt (as has been proposed) to exact royalties on these editions would inevitably lead to a rise in price.

Another type of book where the publisher's rate of profit may be lower is that for which he receives a subsidy from the author or some sponsoring body, that pays the whole or part of the cost of production. Such works are often meritorious, but of such a specialized nature that they will not sell enough copies for it to be possible to market them at a reasonable price. Here, in return for being relieved of risk, the publisher is likely to take a lower rate of profit in order to keep the price within bounds.

Exports are a separate problem. We have seen that discounts are much larger on export sales, the publisher getting less profit, and the author less royalty. This is justified if they are thought of as marginal sales: but if an undue proportion of an edition is destined for export, this must be allowed for to some extent in the pricing. It is significant that the export market is taking an increasing proportion of publishers' production. While the trade's turnover at home has increased by 50 per cent in the years 1947-53, exports have doubled themselves, and last year represented 34.7 per cent of the total.

ADVERTISING

My own opinion is that there is a very great deal of waste in advertising books. Certain books, which may be described as the patent medicines of the book trade, can be sold on advertising just as a demand can be created for patent medicines proper. People's urge for improving their minds or social position through command of language, etc., can be exploited to sell certain kinds of books. These are, however, a small minority. For the range of books of which I have experience, it is a fallacy that advertising will stimulate sales which are falling by raising demand to any significant extent. If a book is selling well, it may have a useful function in reminding people that they did mean to buy it, but it will not create the wish to buy in the first place. Thus publishers use it on a rising market, advertising books which are doing well, not on a failing market in an attempt to reverse the trend, which past experience shows cannot be done.

A great deal of display material is wasted, because booksellers do not have the space to set it out. Here again, if a book is in the news, such as Sir John Hunt's *Ascent of Everest*, it is more likely to be used and more likely to be effective. But it comes after the demand is there, not before.

The best form of advertising, if it can be obtained, is review notices. Publishers, therefore, commonly send out good numbers of free copies of a book for review. Second I would put personal circularizing, particularly for books of a specialist nature. One of the most effective forms of advertisement costs the publisher nothing, and that is personal recommendation from one reader to another.

Generally speaking, a publisher cannot afford to spend a great deal on advertising. If he expects a book to sell well, or if it is selling well currently, the more he feels free to spend on advertising. But if the book has a limited market, any publisher will be reluctant to do more than the minimum of advertising. This is because from experience he knows that the market cannot be extended — but it is not always easy to convince authors of this.

CONCLUSION

It will, I hope, be clear that the rules I have given for price policy are not hard and fast. The publisher cannot stick to too rigid principles, but works on broader lines, hoping to gain on the swings what he loses on the roundabouts, and praying that over the whole range of his production he will be left with a modest profit at the year's end. His prices must be broadly 'right'. His trade has elements both of competition and monopoly. Each book is unique — even in the lighter type of fiction you are not selling just a 7s. 6d. novel but a particular differentiated product. On the other hand, it is uncanny how often a book on a subject however abstruse is followed shortly by another book on the same topic from another house. (We ourselves published a book on Flamingoes which was followed and killed by another within three months: and publishers' lists for this autumn announce two biographies of General Gordon and two books on Cortes, who will need to be stout indeed if both publishers are to get home on his back.) Moreover, publishers are actively in competition to get in their lists those authors who sell well, or, on the scholarly side, those books that will be recognized as of high standing in their field, and will give the publishing house a good reputation.

Prices are at the moment very much in the minds of all connected with the book trade. All branches of it are feeling the economic pinch. Publishers find that the increase in production costs (printing

145 per cent, binding 125 per cent and paper 300 per cent above pre-war rates) and overheads (100 per cent above the pre-war figure) have reduced their margins too far. The nine publishers to whose figures I have referred produced them to show that on general publishing their average profit (with no allowance made for depreciation of stock, nor, in most cases, for the cost of free copies) was 3.61 per cent, or, taking these two factors into consideration, virtually nil.

These statistics were used to support a claim by the Publishers Association for a greater share of the subsidiary rights from books. This was bitterly contested by the authors, who looked askance at the booksellers' margins. The booksellers, who have themselves produced statistics to show that the profit from the sale of books is so low as to imperil the health of the retail trade, are besieging the publishers for more generous discounts. The obvious solution, at first sight, is to raise prices. These have not increased in anything like the same proportion as costs of manufacture, due to economies in production, longer runs and reduced publishers' margins. But publishers are most reluctant to raise the general level of prices, fearing to price books out of the reach of the comparatively few members of the public who regard their purchase as essential or even desirable. (It is significant that, according to statistics published in *The Bookseller*, though the average price per title published or reprinted rose from 11s. 1d. in 1949 to 14s. 5d. in 1953 — an increase of 30 per cent — the book trade turnover on the home market increased during the same period by only 20 per cent.) The publisher is unfortunate in producing an article the demand for which is small, and which can be consumed without being purchased, thanks to the widespread public, subscription and commercial library organizations. It is likely that the prices of some books will rise gently and gradually. It is more than likely that before many years are past there will be fewer independent publishers and booksellers.

OXFORD

SOME ASPECTS OF INDUSTRIAL LOCATION

by Colin Hill

I

The theme of this paper is that whilst much of location theory implicitly assumes that an entrepreneur first considers money costs and allows these to determine where his plant will be sited, in practice he first considers the location and then decides whether the estimated costs of operating there will allow him to make a comfortable — not necessarily a maximum — profit at the ruling and expected market prices. In other words, in real life the factors which *finally* determine the choice of location may often be purely subjective in their nature. It is very unlikely that purely cost considerations ever uniquely determine the choice of a particular location, simply because maximization of monetary profit is seldom the unique determinant of an entrepreneur's action.

Within a limited range of estimated cost, the potential number of sites for a particular enterprise is often very large indeed. All of these sites are not in fact considered because many of them are completely unknown to the entrepreneur. (There is, of course, a number of cases in which the combination of physical requirements is such that only a very small number of sites is available, all of which would be carefully considered, but such cases are comparatively infrequent.)

II

The basic unit in location study is the firm. The firm may be anything from a small one-man business to a vast combine but it is the unit about which all hypotheses must be made. For present purposes firms can be divided into two categories — those in which final management is at the place of production and those at which it is elsewhere. Each will tend to make decisions about location differently. Such decisions are generally made either when a firm starts in business or when a change in the scale of operations is considered.

The majority of manufacturing establishments are small units with final management at the place of production; although it is not easy to determine how many of these units form part of a larger group it is reasonable to suppose that a very considerable number do not.

In 1949 the Census of Production register of manufacturing industries contained nearly 140,000 establishments in the U.K. Of these nearly 80,000 employed ten persons or fewer. The distribution of these establishments among industries is wider than might be

supposed. Over one-half of the 140 trades for which figures are given are industries in which more than one-third of the factories employ ten people or fewer. The Annual Report of the Chief Inspector of Factories for 1948, which is not tied to such a rigid definition of manufacturing industries, shows that of 244,000 factories in Great Britain, 203,000 (about 87 per cent) employed less than 26 workers.

Bakelite Ltd., De Havillands, Lines Bros., Morphy Richards, Murphy Radio, and Perkins Diesel, are but a few examples of famous names in industry which have been built up from very humble beginnings within the last thirty years or so. It is not easy, however, to determine the proportion of small firms which expand, if not so dramatically as these examples, at least to such an extent that much larger premises become essential for them.

Consider how most small firms start and grow. An individual decides to go into business for himself. He may or may not join with others in this enterprise, but normally he will set up in some locality which he knows and in which he is known. He will do this for many reasons. He is more likely to know of suitable premises in his own neighbourhood since probably he will have been looking for them in ever widening circles around his own home. A building licence will not be required since in order to minimize his risks he will want to be established near his home in rented premises. Even if he has to build new premises he may still not require an Industrial Development Certificate, for the building may be less than 5000 square feet.[1] If he remains near his home he has a ready-made headquarters, probably knows his potential suppliers of raw materials and part of his potential market, and may already have assured part of his labour supply before he starts in production. He may not need to engage any highly trained labour because he, perhaps with his associates, will provide all the special skill required.

On the face of it, such a business is highly mobile. The capital outlay is probably small, labour demands are not difficult to satisfy, raw materials may be generally available throughout the country at fixed prices. Potentially a candidate for a Development Area or a New Town, such a unit, in fact, more often than not turns out to be completely immobile; if it is not established where the originator wants it, it will not be established anywhere. If individual enterprise and initiative is uniformly spread throughout the working population,

[1] Section 14(4) of the Town and Country Planning Act of 1947 lays down that 'an application to develop land by the erection thereon of an industrial building . . . shall be of no effect unless it is certified by the Board (of Trade) that the development can be carried out consistently with the proper distribution of industry . . . no such certificate shall be required in respect of . . . any industrial building which will have an aggregate floor space not exceeding five thousand square feet'. Such a certificate is known as an Industrial Development Certificate.

new industry of this kind — the small one-man business — is likely to arise more often in centres such as Greater London and Greater Birmingham simply because these are the chief concentrations of the working population. Unless he lives there, or has close contacts with it, a vast metropolitan market is often scarcely considered by the small man. His resources and potential output are so comparatively small that any large markets within fifty or sixty miles will absorb all this output.

The natural course of expansion of any small firm will be extension to existing premises followed by a quest for more extensive premises as the demand for its product becomes greater. A successful enterprise will expand in its original location, up to the limit of efficient output there. As output rises, storage of both raw materials and articles ready for despatch will demand floorspace which might otherwise be used for manufacture. More extensive premises will be required and the first step will probably be an attempt to extend *in situ* simply by covering open space for the protection of stocks. This may be followed by efforts to obtain accommodation solely for storage. Later a move to larger premises will be considered.

Once again the first consideration of the entrepreneur will be to find these buildings within travelling distance for himself and his skilled employees. He will not wish to set up outside the area in which he and his products are well known. If he did so he would have to meet the cost of building up new business and social contacts. It might also mean that his most valued employees — his foreman, his tool setter and so on — would have to move as well if he wished to retain them. Whatever course he follows, any business man will naturally try to minimize his risk in relation to his potential profit. Faced with the risk of transferring his enterprise to new premises, he will not wish to accept the additional risk of taking on a completely new staff. Not only is his potential immediate loss of production greater, but also his long term prospects become less certain because of the unknown quality of the new labour.

The pattern of expansion will be determined to some extent by the type of product which is being manufactured. If it is a simple product requiring only one or two processes (such as fancy stationery or Christmas cards), the expansion is limited partly by the availability of adequate premises and the distance which the entrepreneur is willing to move in order to find them, and partly by the type of market which he is supplying. If he is marketing a finished product he may feel free to move a greater distance than if his output is to be sold to some other manufacturer for incorporation in a more complex product. In the former case his problem is confined to finding new

wholesalers. If it sells well in one area it may quite reasonably be expected to do well in another. If, however, he does not manufacture an end-product he will probably be less willing to sever his established contacts by moving out of easy reach of them. That he can no longer call in for a chat in the normal way of business will be a major disadvantage which neither economists nor accountants can precisely evaluate.

If the product is more complex, however, the entrepreneur has a wider choice. If he intends to stay in the district in which he first set up he can do one of two things. Either he can sub-contract part of the processing to another firm or he can look for additional premises in which to do part of the work. Whichever he chooses, his ties to his own locality will generally become stronger. If he sub-contracts he will naturally wish to be in close touch with his sub-contractor; if he opens additional premises he will likewise want them nearby so that he can supervise closely. Of course, it may not always be possible to do either of these things within the district, owing to shortage of labour or premises or capacity on the part of potential sub-contractors, but generally he will try to keep all the work close to his main premises.

III

This hypothesis suggests that much of the pattern of industrial development is determined in the long period by decisions which do not have to take into account those provisions of the Town and Country Planning Acts most closely concerned with industrial location (i.e., the exemption from Industrial Development Certificates of new industrial buildings under 5000 square feet, and the comparatively loose control over the use of existing premises). This does not necessarily imply any shortcoming in the framing of the provisions, which are justifiable on grounds other than administrative convenience. If all industrial development were to be controlled, a very great deal of it might be stifled. It would not be difficult, if it were thought desirable, to introduce a much closer control.

At present it seems that effective influence on the industrial pattern of an area is exercised through those established concerns in which the personal element is least significant in choice of location, and through firms immigrant from overseas.

So far the thesis has been developed that when a firm starts in a small way of business it is unlikely to be mobile and that at each stage of growth there are certain personal factors which may tend to inhibit mobility. Where final decisions about location are not made by an entrepreneur of the local owner-manager type there may be more

freedom of movement. Many large firms have set up successful productive units in places where smaller firms have refused to go because of the fear that their costs would thereby be too greatly increased. Of particular interest in this connection are examples of well-known manufacturers who have set up factories in Northern Ireland, such as the British Tabulating Machine Company (makers of Hollerith tabulating machines), and Lines Bros. (makers of Tri-ang toys).

IV

What then are the factors which determine mobility? Apart from the limiting cases of mineral extraction, most industrial undertakings have some degree of mobility, which will vary over time, in respect of both technical and personal factors. Given a sufficiently large subsidy to move, or a sufficiently penal tax for not moving, most entrepreneurs could be persuaded to change their place of production. At some critical time, however, each individual firm is at a peak of potential mobility. This may often be when a considerable expansion is contemplated, or when much of the capital equipment is due for renewal, or when the existing labour traditions are thought to be excessively hampering, or when a change of management has just taken place.

It is at such critical points of mobility that Government action to steer industry is most likely to be effective. None of these conditions for movement will apply to an undertaking when it is first established, but each one may apply during the course of its development. Sometimes several of them may coincide; this was probably what happened in many instances at the end of the war. Conditions for movement were then particularly favourable for a large number of concerns because, although such conditions may have arisen at different times during the war — for example, capital equipment worn out and management due for retirement — it was not possible to do anything about any of them at the time, and action had to be postponed until the war was over.

In the case of larger joint stock companies there is much less chance of the ties to a particular district being personal ones. Expansion may frequently take the form of additional premises elsewhere rather than complete removal to a different area, but even when this is necessary personal factors have much less force. Paid managers and directors take the place of the owner-manager. Employees, especially the more senior ones, may feel tied to the firm by pension or profit sharing schemes and seldom will face any pecuniary loss through moving at the firm's bidding — indeed they may often expect not

only an increase in income but also a tax-free capital gain in the form of assisted house purchase and so on. It could be taken for granted that at least a nucleus of the higher-grade staff and employees would be willing to move.

The greater willingness of large firms to consider moving to or setting up new factories in Development Areas and New Towns may also be ascribable to their closer relations with government.[1] Frequent contacts between companies and government departments give each an insight into the others' problems. The outlook of the management may be wider than in the smaller firms, while the desire to stand high in public and government esteem may do much to influence the larger firm's policy.

V

Since the war, movement of industry has been subject to a fairly comprehensive statutory control. It is perhaps more instructive therefore, to study some of the decisions about industrial location made before this control existed. Of these, perhaps one of the most striking is that of Harland & Woolf at Belfast. Today this firm is one of the largest and most efficient shipbuilders in the world, yet Northern Ireland has practically no coal or iron or steel of its own; virtually all the raw materials for this shipyard have to be transported over comparatively long distances.

An example of complete removal is that of the Ford Motor Company from Trafford Park to Dagenham. Since Southampton was also considered as a possible location for the new factory it seems that, in the company's view, nearness to a port was of greater value than the external economies which the Midlands traditionally offer to engineering industries. It must be remembered, however, that the new factory was designed for building motor cars from the iron ore to the finished product and not merely as an assembly plant; being an American concern, a move over a distance of 200-300 miles in order to manufacture what was virtually a new product may have seemed of much less importance than it would have done to a native one.

The case of Morris Motors provides an interesting contrast to this. Even if there had been control over the distribution of industry immediately after the 1914-18 war, Nuffield might still have developed at Oxford for the reasons argued earlier in this paper. Any statutory control limiting the growth of this concern at Oxford would probably have brought about what has in fact happened in its

[1] See P E P Report on *Government and Industry*, particularly Chapter 9, for a discussion of this relationship.

absence; that is, the Oxford factory has become an assembly plant, with engines made elsewhere in one factory, radiators in another, body shells in a third, and so on.

The motor industry, indeed, provides a study in location sufficiently interesting to justify a slight digression from examples of individual firms' choices of sites. The industry is, of course, dominated by the 'Big Six' who produce about 90 per cent of the total output. Their main factories are all within roughly 100 miles of each other and of London. These factories, however, are mainly assembly plants. Mr. Gresham Cooke, the Director of the Society of Motor Manufacturers and Traders once said that 'it is not generally known that the modern car is often constructed to the extent of about two-thirds from an array of items purchased by motor firms from factories engaged in accessory and component manufacture'. *The Times Review of Industry* (August 1952) estimated that possibly 80 per cent of the cost of a popular car is accounted for by parts bought by the main firm from other manufacturers.

Many of these parts are bulky or fragile or otherwise difficult to transport. A load of chassis frames or body shells, for example, is not easily handled. Motor tyres and latex foam cushions take up a good deal of space. Batteries are heavy and require careful handling. It would be reasonable to expect therefore that the firms making components tended to be very close to the assembly plants. To some extent this is true. Briggs bodies for Ford vehicles are mostly made at Dagenham and the Pressed Steel Company makes bodies for Nuffield cars at Oxford. But Briggs also made, until recently, bodies for Leyland Motors (Leyland, Lancashire) and for Jowetts (Bradford) their nearest factory to either firm being at Doncaster; Pressed Steel at Oxford manufacture for Austin and Rover at Birmingham. Ball bearings are made at Newark as well as at Luton and Birmingham, latex cushioning at Harrogate, brakes at Leamington, Derby, Chapel-en-le-Frith, and Cwmbran, window glass at St. Helen's and so on. Lord Lucas stated in a debate in the House of Lords that of the two largest car firms in the country one draws its materials, semi-finished materials, bought out assemblies and components from 750 different factories at an *average* distance of 100 to 120 miles from its works; the other draws supplies from 450 different factories at an average distance of 110-130 miles.

This pattern of industrial development was mostly determined before the war, at a time when there was no central control over the location of industry. Whilst there is, of course, a considerable concentration of the motor and motor components industry in the Birmingham-Coventry area, it is evident that large quantities of

components were and are customarily carried over long distances for incorporation in the final product. This suggests that the external economies of being close to the central market were often outweighed by other considerations at a time when choice of location was virtually unrestricted.

VI

The examples cited above are but few of many in a wide range of industries and suggest that, in industrial location, where there are many unknowns, the choice of site, although rational, may not always be determined by purely objective economic considerations. It is not necessarily true that an industrialist knows best how to make the greatest monetary profit or is even interested in doing so, for often he may be as ignorant of potential sites and of accurate methods of costing as the civil servant or town planner may be of the intricacies of a particular firm's production and marketing problems.

Before the war the majority of industrial movement — as shown in the Surveys of Industrial Development — was over short distances, mostly within the Greater London and Greater Birmingham areas. Long distance removals to or from these areas, or between other localities, were comparatively rare. (A notable exception to this generalization was the aircraft industry. In this case, however, the movement was generally from one aerodrome to another. The number of aerodromes, and hence potential sites, was comparatively small, and each site would probably be well known to most aircraft manufacturers.) This pattern of movement is consistent with the hypothesis put forward in Section II. Generally the firms would be moving within an area of which they had knowledge. The inducement to move was often a modern factory to rent or to purchase, fairly cheaply, in physically more attractive surroundings than the original site, yet not so far distant from it that existing business contacts were lost. For the firm with an established market the risk of movement was small, the cost comparatively low. It was movement against a background of few scarcities. Labour, building resources, and capital were, generally speaking, readily available anywhere in the country. There was no inducement to move over any long distance, no reason to abandon business acquaintances in order to get into production rapidly.

It is against such a background that a policy of steering industry may have to work in the not very distant future. Until recently it has been operating in peculiarly favourable circumstances, since the premium for rapid acquisition of productive resources has been high. In the immediate post war period the Development Areas generally

had a 'windfall profit' of new industrial enterprises because distribution of industry policy was rigorously applied and the choice facing an industrialist who wanted to expand production was often between going to a Development Area reasonably quickly or setting up elsewhere only after appreciable delay. As the emphasis on exports and defence became greater, however, the opportunity for the industrialist to call the tune increased.

The steering of industrial development is often as much a question of personalities as of economics; the stronger an industrialist's bargaining power in relation to the economy of the country as a whole, the easier it is for him to settle where he chooses; on the other hand the administrative task of steering industry is easier the greater the demand for factory space.

It is therefore apparent that when existing premises become more readily available in the congested areas, the task of steering industrial enterprise from those areas will be very difficult, and the need for so doing a subject of considerable debate. In this debate, however, adequate consideration must be given not only to the private costs of the industrialist but also to the real costs incurred by the community in every decision concerning industrial location.

LONDON

POLICIES THAT HAVE BUILT THE MORRIS BUSINESS

by W. R. Morris (Lord Nuffield)

Editor's Note

This article is reproduced from *System*, February and March, 1924, with permission of the Editor of *Business*, the Journal of Management in Industry, in which *System* is now incorporated. The original articles were re-discovered in the course of work on the biography of Lord Nuffield, to be published towards the end of this year. It was thought that the views expressed would be of sufficient interest to readers of *The Journal of Industrial Economics* to justify re-printing, in view both of the author and of the stage in his business career at which the articles were written. The articles themselves were based on a series of talks with Mr. Cecil Chisholm.

Mr. W. R. Morris, as he was then, was the Governing Director of Morris Motors Ltd. He had emerged as the most successful entrepreneur in the British motor industry which, although it was on a strong upward trend, had had a very severe shaking in 1920-21. The war had interrupted the development of the British industry. The turnover to war activities both delayed the satisfaction of an increasing demand for motor vehicles and considerably strengthened it, the military vehicle producing a much wider awareness of the possibilities of motoring — as well as considerably increasing the supply of trained drivers. The industry was still at the pioneer stage of small businesses, and although many had already gone out, in the immediate post-war period many more entered the industry. In the short boom of 1919-20, the motor manufacturers were severely limited by difficulties of reorganization and supplies but they fully shared in the general slump of 1920-21. In fact, that hit them earlier than most industries and lasted rather longer. The proportionate fall of demand was greater than it was in the slump of the early nineteen-thirties. Of the 130 or so makes of private cars being offered for sale in 1920, over eighty had ceased production by 1929, the majority in the earlier part of the period.

Morris himself had started making cars in 1913, but his business was on a very small scale then and the 1914-18 war held up his development although his very first models had attracted considerable attention. He had to make a fresh start, with new suppliers, in 1919, and, at the very time when other manufacturers were still in the slough of the depression, Morris's shot ahead. From being an insignificantly small part of the national industry, the company's sales grew until in 1923 and 1924 it was 28 per cent of the total. The enterprise of *System*, therefore, secured a record of Morris's views at a most interesting period in his career; in the articles which it published he expounded the views on management and business on which he

had acted. When reading these views now, the date must be remembered. Morris's opinions were indeed those which informed his business life then, but it does not necessarily follow that in changed circumstances his opinions would remain unchanged. Certainly, with the continued growth of his businesses, and because of various legal and financial factors, the form of his enterprise changed eventually to that of the large public company with a Board of Directors and considerable delegation of management. These considerations, however, are not relevant to the formation of the Morris business and its growth to the position at the time when the articles were written.

They explain, as far as anything can, the progress of W. R. Morris, from the boy who repaired bicycles, but in his own business, to the garage owner and finally the car manufacturer. He had a vision of the mass market — 'what had happened with bicycles would happen with cars' — and to this end not only designed cars which would suit the convenience and tastes of the mass market of owner-drivers, which he looked forward to, but practised every economy he could to reduce the price of his cars. This article gives something of W. R. Morris's philosophy, and the policies by which he realized it: his policy of ploughing back nearly all the profits into the business, his policy of complete control, both managerial and financial, his policy of fair play — towards labour, towards suppliers and towards the public. It also gives something about his methods of production: how the experience of mass assembly from fabricated, standardized, parts of mine sinkers during the war affected his organization of the car business later; and how he stuck to the idea of an assembly plant, buying supplies out so far as possible. The careful organization with suppliers is described here. The growth in the scale of his operations had forced him more towards manufacturing; by 1924, Morris had been forced to buy the companies producing his engines, bodies, and radiators, but only, as he says here, because they were unable or unwilling to produce the supplies in the quantity he wanted. The growth of the business also forced him to have a deputy managing director, and eventually to the further organizational changes already mentioned. In 1924, however, W. R. Morris, looking back over the growth of his business, could see that it was as he wished it to be; his theory of management and the practice were the same. In this way, the article is a valuable historical record — an endogenous case-study of management in an important business.

In this reproduction, the only changes have been to shorten slightly and to omit one or two passages where the detail was chiefly of contemporary interest; these have been indicated at the appropriate places.

I

People have a trick of saying that the successful man is 'lucky'. This may be soothing to the unsuccessful candidate, but it is usually nonsense. Any success I have had has simply been the result of taking my opportunity — and working 'like a nigger'. When I was running the Morris Garage at Oxford in 1911 I became convinced that there was going to be a big demand for a popularly priced car. What had happened about bicycles I felt sure would happen with cars. With the exception of the War interval, most of my time since that date has been spent in the effort to produce such a car.

I suppose that, by 1914, with a small works going, I was in very much the same position as a score of other makers who were, consciously or unconsciously, after the same thing. This year our turnover will be round about £10,000,000, with an output of 35,000 to 50,000 cars. Several of the other men who were straining towards the same goal have either remained in a small way, or have gone under. This has surely not happened because we were lucky, but because we took the right steps to achieve the three vital ends necessary — the first was a continually improving product; the second was a reduction of cost so that prices could fall continually; the third a conservative financial policy which should avoid the risks to which a small, quickly expanding concern is liable. So many small men concentrate on one of these aims — and forget the other two. Yet to fail in one alone is to court disaster.

Let me say at once that our success has not been achieved by what is commonly called 'mass production'. I prefer to spell 'mass' with an 'e'. So far mass production has meant merely *mess* production when applied to motor cars in this country. We have evolved our present methods from the experience gained in producing 2000 cars in 1919-20, 4000 cars in 1920-21, and 6000 cars in 1921-22, and 18,000 cars last year.

By this means we have been able to avoid laying down costly schemes without sufficient previous testing, which might have bankrupted us, as they have so many other concerns. Further, we have been able to expand out of our own earnings and thus to avoid the handicap of a directorate, and all the ills to which a public company is heir.

But let me get back to the early days. So long ago as 1912, I became convinced that the best way for the small concern to manufacture . . . was to get specialists on every separate unit of the job. The work is better and more cheaply done, while the cost and worry of more plant is avoided. Money is conserved for better use in other directions. Even at the end of the war, when we could have started

to produce the Morris car very largely in our own works, I held to the other policy. There is no point in producing any article yourself which you can buy from a concern specializing in that work. I only buy a concern when they tell me they cannot produce enough of the article in question for our programme. The Hotchkiss Company, for instance, said they could not produce more than 300 engines from their Coventry factory. So I purchased the concern twelve months ago. Already, by re-planning the shops, by putting on an extra shift and by saving space everywhere, we have produced 600 engines a week out of the identical cubic space. We are now extending this plant to produce three times this number.

Even at the present moment, we have contracts running with at least 200 firms for various parts. At Oxford we merely assemble. However, we now make our own engines at Coventry, and bodies at our own works in Coventry. But our methods of using outside services is, I believe, more thorough than is usual. To begin with, we buy our own raw material for the job; we fix up contracts, possibly with four or five firms up and down the country, to maintain that supply of raw material for us. We personally inspect the raw material before it is delivered from contractors; we settle the method of machining; we supply gauges, and in many cases we design the actual fixtures. The whole of the finished parts are delivered to us; they are tested on our own inspection benches, and then issued into our component stores. The firms working for us simply undertake a machining contract; we guarantee the material; we allow a percentage of scrap free; and we place long contracts, so that the financial liability of the concern is limited.

It will be argued that, with our large output, we could do the thing cheaper ourselves; that we are piling up transport costs, and so on. This is largely an illusion. The outside firm that makes perhaps only one important part, is probably making in even larger quantities than we should. It is interested in nothing else; therefore it can keep its governing brains concentrated on the problems connected with that unit, in a way impossible to a concern manufacturing a highly complicated article. Even the cost of transport is little increased. For it costs only a fraction more to send steel from, say Sheffield to Birmingham to be machined and afterwards to transport the finished unit here, than to pay carriage on the full weight of the raw material direct from Sheffield to our works. Personally I believe that in a highly-organized industrial country like ours there are great opportunities in many lines for the small, keen firm that will devote itself to highly controlled and standardized assembling of many types of goods.

How, it may be asked, do you keep up standards of workmanship, particularly in small works that are supplying you? The secret lies largely in the judgment of the man who places the initial contract. Our production manager invariably gets to know personally the chief of any firm with whom he considers doing business; indeed, he cultivates those responsible right down to the shop foremen. It is his rule never to place a contract unless he has seen the works.

Naturally, economy being our main principle, we frequently ask contracting firms to do work at prices that they believe to be impossibly low. Usually they have not realized the savings which we can help them to effect by standardizing operations, by giving a continual flow of work, and by technical assistance. Many firms have taken on work purely on our assurance that it can be done at a certain price; and none has yet 'gone broke'. Our experience is that the arrangement becomes either semi-permanent — or it does not last five minutes.

I have said that one of the vital elements in securing success today is price. My aim has been to keep ahead of the market. We have never waited for the public to ask for a reduction. We get in with the reduction first. Is it quite sufficiently realized in this country that every time you make a reduction, you drop down on what I may call the pyramid of consumption power to a wider base? Even a ten-pound price reduction drops you into an entirely new market. If the man cannot pay the last £10 in the price, he cannot buy the car. When that £10 is knocked off, he very often can and will. The one object in life of many makers seems to be to make the thing the public *cannot* buy. The only object of my life has been to make the thing they *can* buy.

There is another current opinion that, if you only make enough of a given article, your price will come down romantically. This is not the fact. To get bed-rock selling price you have to be practising every sort of economy, great and small, all the time. There are no marble halls at Cowley, and there never will be. Not an unnecessary penny is spent in selling or publicity. Every ha'penny available is put into the production. So far this policy has justified [itself by] results. From 1912 to the end of 1918 I did not spend one shilling in advertising. The goods sold themselves. Even now, I rarely go outside the trade press.

But to keep down costs, you must have a staff of workers who are interested. My experience is that if you look after your men, they will look after you. A low wage is the most expensive method of producing. A moderately high wage is the cheapest. The 30s. a week labourer — and I have had ample opportunity of studying him

in England — is bored to death when he leaves the works. And boredom in the evening breeds slackness during working hours. What incentive has a man to work hard, if he is not going to have enough money to enjoy himself in the evening?

A moderately high wage, particularly if it depends on effort, gives a man an interest in life. Men will only work if they know they are going to earn more home comforts, hobbies and amusements. Isn't that true of yourself?

One of the most difficult problems today is to adjust wages to effort. Our works manager has a system of his own which has always seemed to me to be extraordinarily happy. To begin with, he has graded all our workers on an hourly rate (classified alphabetically for convenience) there being a difference of 1d. per hour in each grade. A new man coming to us is classified at first according to age. He will probably start from Grade T, and by the time he is 21 or 22 he will generally be in Grade M2, with an unskilled labourer's wage of 14¾d. per hour. The trade union rate for the unskilled labourer works out at about 30s. per week. Practically every worker is included in our bonus scheme.

By going back several years, our works manager found what he considered a fair minimum output of cars from each man in each section would be. The trouble with most bonus systems is that they make no allowance for the increased output per man secured from the mere fact of increasing the number of men in a gang on work like assembling. Actually the just increase of output by increasing the number of men rises in a curve and not in a straight line.

The works manager calculated mathematically the power to which a man's output was raised by increasing the number in the squad. He found, for instance, that a fair minimum output of cars would be 1.2 (men in gang) $^{1\cdot15}$ for erecting; 1.35 (men) $^{1\cdot32}$ for assembly. For testing, where there is no gang work, the formulae is 5.1 (men) ^{1}.

Thus, if 60 men are working on sub-assembling, they must turn out 225 cars before they gain any bonus.

How is the bonus calculated? Suppose that we have 60 men on sub-assembling, and that they produce 450 sets, the rate of exertion $= \frac{450}{225} = 2$. Therefore, the man's bonus = 45s., if he is rated at M2 [see Figure 1.] If he is lower rated, he gets a bonus in proportion. The man who was drawing £2 14s. would get a bonus of £2 5s. — a total wage of £4 19s.

The results of this system have been remarkable. For instance,

since the men are on collective bonus, there are no unnecessary demands from foremen for extra help.

Let me give an instance of what has been done. We were turning out 425 cars a week on line assembling, but we wanted 500. We could have got it by putting the men on overtime, but we do not pay a

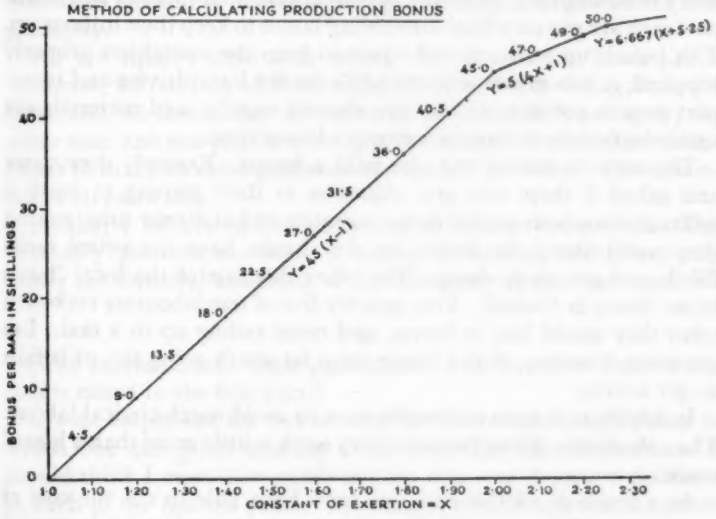

FIG. I

bonus for any work done on overtime. (No overtime has been necessary since this scheme was introduced, although formerly it was the normal thing!) Instead of taking the obvious course, the works manager went over the line and re-timed all the stages. At several stages he found he could speed up by putting on additional men. Finally he decided to put on four extra men. Naturally the men already on the job grumbled. We said 'All right, these men will not take part in the bonus to start.' At the end of a fortnight we were getting the 500 cars a week! The foreman actually came and asked the works manager to put the other men on bonus since they did not think it was fair they should be without their share.

We have therefore elaborated a standard plan by which new men get no bonus during the first fortnight; a quarter part of the unit bonus in the third week; a half of the bonus in the fourth week; three-quarters in the fifth week; and the full bonus in the sixth week and thereafter.

We have practically everybody on bonus. The foremen receive a

bonus per car according to a grading based on capacity. Last year this bonus worked out at a few pence on every car for each foreman. The men on the final assembling are also paid by bonus — and we have reduced the total working time for putting a car together to 41½ minutes. (This season, by the way, we shall be turning out a car every two minutes!) Even the store-keepers and inspectors and transport men are put on a final assembling bonus to keep their interest up. This puts it up to the store-keepers to keep the assemblers properly supplied; it also makes it worth while for the lorry-drivers and transport men to see that stations are cleared rapidly, and materials got up to the factory without a moment's loss of time.

The men on testing are also paid a bonus. Recently they came and asked if there was any objection to their coming to work a quarter-of-an-hour earlier in the morning and at dinner time, so that they could dump the bodies on the chassis, have the petrol tanks filled, and get away sharp. The other day one of the local 'buses broke down in Oxford. Very quickly five of our labourers reckoned what they would lose in bonus, and came sailing up in a taxi. Let me insist, however, that a bonus must be worth going for, or it fails to get results.

In addition, it must be simple, so as to avoid much clerical labour. The calculation of our bonuses every week is little more than 2 hours' work.

As a result of all this care, we have been able to cut the cost of production of the completed car by 30 per cent when we increased the weekly output from 300 to 500 cars. At the same time we were able to get the cost on one important unit down by so much as 45 per cent.

My financial policies have been, of course, no less important a factor. They are so simple, that you may be inclined to smile at them. Yet, I owe very much — more than I can tell — to sticking to them. In the first place, I have insisted on financing the company from the inside. I have never gone to the public for ordinary capital. In consequence all the directors are 'still under one hat'.

This not merely makes it more easy for me to control finance. It gives rapidity of action which would appal many chairmen of limited companies. I can get things done while a Board would be brooding over them. For instance, I rang up the principal of a certain firm and proposed buying their factory one Wednesday morning; the following Friday afternoon I had bought the concern and completed the financial arrangements. Six weeks afterwards, we were into production, when the average Board would still have been weighing the possibilities.

My second financial policy is to demand payment promptly, and to pay absolutely on the spot. A firm that is supplying us knows that, whatever happens, on the day which is arranged for our monthly payment, our cheque will be in the office. The small manufacturer can budget accordingly. He can save himself — and me — an enormous amount of money by being able himself to pay all his bills promptly.

We are equally stern with others. As soon as we 'black list' a customer, we cut him off from supplies. I believe in facing financial facts: and the fact is, that if you do not pay your bills promptly, the other man assumes you have not got the money. He therefore determines to make an extra profit out of you, to cover what he justly considers an extra risk.

Finally, I believe in the budgeting of finance every week. The Secretary presents me with a weekly statement which actually shows the financial condition of the Company at that moment. . . .

II

[The second article dealt particularly with inquiries about some points raised in the first part.]

Let me emphasize the fact at once that there is no single policy to which one can point and say — this built the Morris business. I should think I must have made not less than one thousand decisions in each of the last ten years. The success of a business is the result of the proportions of right decisions, by the executive in charge. If the majority of his decisions, made often under conditions of pressure and hurry, are right the business will probably grow, if the majority are wrong, the business will eventually go to the wall.

Ultimately the proportion of right decisions depend on that extremely complex quality — judgment. Judgment eventually depends on balance of mind. In my experience, the evenly balanced individual has the surest gift of judgment. The plague of business is the man who has exceptional ability in one line, but none in others. This makes balanced judgment impossible to him; in other words it makes him a bad manager. The man at the top of a business had best be a 'Jack of all Trades', not confined to a mastery of any one. This makes for a round view of the facts, and therefore for balanced judgment use.

Given a sound business training, and the faculty for weighing the different interests of the firm in the balance, a good business man will make a success of any type of concern. Take Selfridge and put him in a motor business or a bacon factory, and I think he would make good.

There are very few types of business which I would not be ready to tackle with some hope of success, relying entirely on my experience in general. However, the continual expansion of this concern makes the experiment impossible for me. Yet there are one or two trades which I would dearly love to have a shot at — they seem to suffer from such a lack of initiative!

What was it, one inquirer asks, that made you adopt the assembling method, rather than that of centralized production in one plant. This was partly accidental, and partly the result of previous experience. To use the assembling method successfully involves a detailed knowledge of scores of trades — a knowledge which is not easily available.

But after the close of the war it seemed to me to be more logical to use factories already in existence, rather than to build an enormous new one. Factories were then waiting to be put in use; often they were in very competent hands; only the market was necessary to start the wheels turning. Obviously, the most economical and efficient method of procedure was to have one unit made in one factory, where the product could be greatly improved, real managerial talent being concentrated on that problem alone.

This was the accidental element which influenced our decision. The other element was the peculiar experience gained during the war, and what could be done with specialized firms on contract, closely supervised at every stage.

In 1916 there was an enormous demand for mine sinkers by the Navy. They could not be turned out in anything like the numbers required. All the large factories seemed to be already fully occupied. The authorities finally agreed to a suggestion of mine, however, that we gave up the idea of making a complete mine sinker in any one works. Instead, I suggested that we used several scores of these small works up and down the country, each producing one unit only, and assembling the mine sinkers at Cowley,

There were great difficulties involved. Before we could start making a single mine sinker, we had to prepare jigs to which the contracting firms could work for every unit. We had to lay down standards; give jigs, drawings and full particulars to each house; we had to test the raw materials supplied to these contractors; every part had to be tested before it was used for assembling; and we had to have an enormous central stock depot here, so that assembling could go ahead on a larger scale.

The results justified the scheme. Out of a country whose productive capacity was supposed to be exhausted by previous contracts, we were able to produce one thousand mine sinkers a week. The

Admiralty had been paying £40 to £50 apiece for these mine sinkers, yet the Government auditors ascertained cost per unit under our methods worked out roughly at £30. Approximately we produced 45,000 mine sinkers; as our production outstripped the Navy's demand we had to take the Crystal Palace to store them in!

It is these methods — by no means the normal methods of assembling — which we have applied to the Morris car. Our metallurgists are responsible for the metals used by the contractors; our works manager is responsible for the setting of their tools to jigs; our drawing office is responsible for the drawings to which they work: in other words, we do everything that is humanly possible to control and assist outside specialists. Merely because each of these firms is concentrating on one line, they are able to secure improvements and to lower cost of production in a way which would be impossible in a great concern whose designers, production managers and works managers were scattering their energies over hundreds of units and thousands of operations.

One gentleman wants to know why the item 'accounts receivable' does not figure in my weekly financial review. He adds that that figure runs into tens of thousands today, in most businesses known to him. 'If we could collect the lot, many of us would be able to retire! Haven't you huge sums owing to you all the time?' he asks.

No — I have not. And thereby hangs a tale! The motor business is unlike any other in its financial arrangements. The motor manufacturer generally sells his cars to his agents 'cash on delivery', and has a small deposit with the order. So long as one gives real value for money there should be no need for giving credit. For this reason several concerns have been able to start up on a very small capital.

Actually some of the best known American concerns started business more or less on this basis of — hope. A friend of mine well remembers an early visit to Detroit — when he found the founders of one world-famous concern assembling cars in a back-yard *in the open air*! They had very little in the way of shops at all. Today that concern sells hundreds of thousands of cars every year, and possesses some of the finest factories in the States.

Since we sell almost entirely for cash, therefore, the item 'accounts receivable' is not relatively a large one. My motto of prompt payment — given and received — still further reduces the possibilities of book debts accumulating, and our agency is so valuable to the dealers that they are glad to pay promptly for prompt delivery.

On the 5th of each month our commitments are tabulated for the month. On that date, therefore, I know how many cars we are

going to *sell* during the ensuing month; what they will cost us; and what we shall have to pay out during the month.

Cash on delivery is the bright side of motor finance: but there is another. Let us say we sold £500,000 of cars in January; we know what we want to spend in February; but we don't know *absolutely* what we shall sell in February. Suppose a transport strike or a sudden slump comes along! Immediately, of course, we hold a meeting of the production, sales and finance people, to match up production to a reduced selling programme — but a quarter of a million of money may have gone into production, before one can adapt oneself to the new conditions.

In the slump of 1921, we actually allotted financial quotas to each department, and saw that they were not exceeded. To do this, we had to analyse every consignment of parts that came in, to see that we had only 100 frames — and not 150 — for 100 cars. We analysed the whole of our expenses *day by day*.

In this business firms don't die of uncollected book debts; but they do perish of depreciated stock. A car depreciates — and car parts depreciate — at an appalling pace under factory conditions. It takes just four days to ruin the appearance of a perfectly-polished Morris-Oxford radiator. Therefore we aim never to have finished cars on our hands for more than forty-eight hours.

To fit parts delivery so closely to production, and production so highly to dispatch requires very careful organization. Despite this, we rarely have less than 1500 complete chassis 'in progress' at the Cowley works. . . .

[At this point there follows a description of the method of keeping check of the flow of production and of work in progress within the factory, together with the quantities of supplies which had been arranged.]

Only by the use of such close checks have I been able to finance this concern largely from within. Happily I have no expensive hobbies! Nor would I care to live anywhere save next door to the works.

When I decided to start for myself — I was just seventeen at the time — it was because I felt that no one else would pay me so well as 'W. R.' (At that time I had nothing — not even a £5 note.) But I expected then, as I expect now, that to build a great business, one must be content to turn back 99 per cent of one's profits into expansion.

After all, this is true of the small business. When I was running the first Morris garage at Oxford, I naturally put most of my profits back into the business, just as I had done when I was building bicycles as a boy. Why should the same not apply to the large

concern? Personally I think that the ease with which money can be raised for a public flotation in this country may not have proved an unmixed blessing for home enterprise. It has tended to make absentee management easy by shifting responsibility from the original owner to his board, both of whom may so often become absentees. Yet nothing is more pernicious to sound business.

On our selling methods I need not dwell. Until quite recently we have distributed cars rather than sold them! As I said in my previous article, from 1912 to 1918, I did not spend one halfpenny in advertising, the cars sold themselves. Last year we reached a turnover of £6,000,000 with a sale of roughly 18,000 cars — and yet we did very little advertising outside the trade press. But this year we shall probably treble our output and the selling pressure will be increased proportionately.

Personally I do not think that this country has yet really taken to motoring seriously. Until the worker goes to his factory by car, I shall not believe we have touched more than the fringe of the home market. So I have little fear for the disposal of our thirty-five to fifty thousand cars this year!

The problem of our sales department is not so much finding the buyer — although it may come to that when our sales are many times their present volume — as discovering means of educating the retailer to our point of view, which is — expansion. . . .

We have divided the country into 114 large districts, in each of which we have a direct dealer who contracts to sell a certain number of cars per annum; these dealers in addition to selling to the public sell to, and control the retail sales of, some four hundred sub-dealers. Then there are the casual trade sales, which come from innumerable small dealers who are not in direct touch with us.

The problem of our sales department is perhaps a little peculiar. In this country the dealer has got into the habit of thinking of car sales in small numbers. Yet our whole aim is to sell cars in large numbers. We get our own profit; we keep the dealer's profit reasonable; simply in order that we may be able to sell cars in quantities. Having educated the dealer to this point of view, the next trouble of the sales manager is to train him to the idea of personal expression.

For instance, if one of our dealers sold one hundred cars last year he was probably extremely pleased with that result. He thinks his showrooms, his sales staff, and everything else superb — and good for another ten years. What our sales department wants, however, is a sale of two hundred cars next year, and not a repetition of the previous feat. To get such a result, the commercial manager has not only to convince the dealer that the worry and trouble of expansion is

worth while, but has to talk to him about better showrooms, about the cubic space required for the sale of larger numbers of cars, of the art of selling and advertising, of the number of staff required per sale, and so on.

Two sales problems common to most concerns today are constantly with us. The one is under-cutting, the other is complaints. Everything from railway locomotives to razor blades is subject to price-cutting at the present time. Under conditions like these nothing can prevent this. Perhaps we take more care than many others in the effort to catch out the miscreant!

Wherever we find that the price of a car has been cut below our standard rates, we hold the direct dealer who controls the territory in which the cut price was given, absolutely responsible. The sales department takes the utmost trouble to discover precisely by whom the sale was carried through. Usually it is some small dealer who is trying to favour a client. When we have traced down the dealer responsible, we insist on the payment of the difference between the price at which the car was sold, and the list price. Practically every week we have a cheque in as a result of an illicit sale which we have tracked. We actually discovered one man who had sold a car for a profit of 10s. It frequently happens that a small dealer will be able to sell a £200 car for a profit of £5. When such a dealer gets squeezed out, there can be little wonder. On such a basis the making of a sound net profit is impossible.

One continual small source of anxiety to the owner is the cost of running repairs. A little garage in Cornwall may charge three times as much as a city garage for de-carbonizing, grinding in valves, and re-setting tappets — a process necessary to all cars, even the Rolls-Royce. We are therefore instituting a system of standardized repair charges.

One of the things we have to impress on a dealer is the necessity for holding a sufficient stock of spare parts. Only under these conditions can we give service to the owners of Morris cars. It will be realized that most of the work touched dealing with complaints falls under the same heading — the giving of service to the man who has once bought the car. The satisfied owner is one of the best possible selling media in this trade — for motorists are incorrigible talkers of 'shop'. Only by service after purchase can you keep the owner satisfied — and get his selling force behind your product.

SOME ASPECTS OF THE RETAIL GREENGROCERY TRADE IN AN INDUSTRIAL WORKING-CLASS DISTRICT

by Eric Gornall

1. Introduction. The author has recently been studying economic theory and has been led to reflect on his experience of a greengrocer's shop, run by his family in a working-class district in the industrial North of England. This paper is the result.[1] It has three main subjects: first, determination of greengrocery prices, second, competition between greengrocers, and third, the entry of new sellers into the trade. But to begin with, the greengrocers' shops, and the area in which they compete, must be described.

The shops can be divided into three groups: (1) the multiple shops (i.e. the Co-op and the regional firm), (2) the well-established, independent shops, and (3) the small 'new entrant' shops. A further distinction can be made between the dearer, better quality shop, and the cheaper, poor quality shop; in this area, the 'new entrant' tends to sell cheaper (and poorer quality) fruit and vegetables.

There are nine greengrocers' shops in the district, which compete actively with one another. This excludes grocers' shops which also sell greengrocery.[2] Most of the shops are in the main road, i.e. the 'shopping centre', and some are not more than a few yards away from each other. The rest are in side-streets which run into the main road, or they are further along the main road, at a distance from the 'shopping centre', but near enough to be 'area competitors'. It will be useful to describe each shop with reference to the distinctions already made.

A.: A well-established, independent shop where the owner-proprietor employs his wife, and an assistant. The shop's reputation is based upon the quality of what it sells, even though the price may be higher. The shop itself is fitted with enamel and chromium shelves, a number of weight scales and a cash register; in the out-buildings there is a refrigerator. The shop sells fish, rabbits and poultry besides fruit and vegetables; it has been a greengrocer's shop for many years.

[1] The economic theory which the author has in mind can be studied in *Theory of Monopolistic Competition* by Edward H. Chamberlin, Harvard University Press, U.S.A., 1948, or, more briefly, in *Distributive Trading* by Margaret Hall, Hutchinson, London, 1949.

[2] In these shops the sale of fruit and vegetables is very often simply a means of increasing gross turnover; the grocer does not compete severely with the specialist greengrocer, for what he sells is usually restricted to a few apples, oranges and potatoes, which his customers will take with their groceries.

B.: A smaller, independent shop, directly opposite shop A. This shop has a reputation for 'cheap' vegetables; prices are generally lower than those in shop A, but the quality of the product is not as good. The fittings are 'home-made', i.e. poorly constructed wooden 'bins'. The shop sells only fruit and vegetables (with tinned goods). Recently, the owner has gone out to work, and his wife manages the shop.

C.: A branch of a regional multiple firm. This shop sells fish and rabbits besides greengrocery; but it has no refrigerator, and often its fish is not as fresh as that in shop A. Like shop B, it is a 'cheap' shop, and the quality of what it sells (at least in some lines), is poor.

D.: This is owned by a Co-operative Society; it is directly opposite the branch of the multiple shop (C), and like the multiple shop, sells more cheaply than shop A. In addition to greengrocery, it sells fish (cod and haddock), rabbits, flower bulbs, grass seed and chemical fertilizer. The shop is part of the Co-operative branch in the area.

All these shops are near together in the main road; the other shops are further away, but are nonetheless competitors.

E.: A branch of a local multiple firm. This shop sells flowers, plants, wreaths and cacti as well as vegetables and a small amount of fish. Often its prices in some lines are lower than those of shop A, but it is regarded as a 'better' quality shop. Also it is on the same side of the road as shop A, and potential customers are able to compare prices as they walk past one shop to the other.

F.: This shop sells mainly flowers, and its proprietor makes his own wreaths and sprays. The shop has only sold flowers and greengrocery for a relatively short time. As a result, the owner has had to build up his own trade. It is a 'better' quality shop, and its prices are no lower than those in shop A. But the owner has gone out to work, and left his wife to manage the business.

The shops which have been described, may be regarded as 'well-established': shop A, for example, has sold greengrocery since the beginning of the century.

The rest of the shops are 'new entrants', which came into the trade during 1953.

G.: A shop in one of the side-streets, which, before selling fish and greengrocery, sold bird seed, cat and dog food, goldfish in bowls and so on, i.e. a 'pet' shop. The quality of what it sells is poor, but its prices are usually lower than those of shops A, E and F, for similar lines of vegetables.

H.: A small lock-up shop in another side-street which, before October 1953, was used by a blind man making baskets. There are

no fittings, except a new weight scale. The prices of fruit and vegetables in this shop are no lower than those in the better class shops, but the quality of its products is inferior.

I.: Another 'new entrant' shop (September 1953) which had sold drapery and bootlaces, and had taken shoes for repair. This shop has been painted, and made to look attractive. The quality of its products is good, and its prices (in some lines) are lower than those of the well-established, 'better class' shops. But here the proprietor works in the wholesale greengrocery market, while an assistant manages the shop.

These are the shops which compete with one another in the area,[1] and they have been selected because any one greengrocer cannot help but consider the prices and qualities of fruit and vegetables in the other eight. Although all the shops may have their own customers, they compete amongst themselves by (1) price (and quality) policy designed to attract customers away from their competitors, and (2) by an attempt to buy more cheaply than their rivals in the wholesale market. First, prices will be discussed.

2. *Prices*. Greengrocery prices are based on wholesale costs. These costs have to be 'covered', plus a return for the greengrocer's labour (handling the products, opening boxes, setting out the window, piling up fruit, trimming vegetables, etc., and, finally, serving the customer), and the risks involved in holding stocks of fruit and vegetables. The costs of one greengrocer are likely to be different from those of another, either because of differences in buying skill or of differences in services, etc. As a result, prices between various greengrocers may very often be different. But the greengrocers compete amongst themselves, so that the prices in one shop are not independent of prices in another. It is both true to say that one greengrocer's prices are determined by another's, and that they are not.

In the long run, a shop cannot consistently offer the same quality of fruit and vegetables to the customer at a higher price than a rival shop, without its trade continuously shrinking. The 'cheap' shop will usually buy cheaper wholesale lines than the 'better' shop, and will tend to sell the vegetables 'as they come'. By contrast, the better quality shop will always 'pick over' what it is selling; therefore, it will sell higher quality lines for significantly higher prices and unless the maintenance of that quality difference involves costs (at one stage or another) which are commensurate with the apparent

[1] There is, of course, competition between these nine shops and shops outside this area, but together they constitute the most clearly defined 'competitive area' from the point of view of the particular shop of which the author has direct experience.

differences in margins, competitors will tend, where they can, to move into that quality, and customers will shift to where they can get better value. Thus, in the long run, a 'dear' shop must be a 'quality' shop. Its trade will be built up on the assumption that its vegetables are of better quality than those of its rivals (this is not to imply a kind of spurious persuasion and policy of charging what the market will bear). The 'high class' greengrocer will have to earn his reputation, and his holding costs will be proportionately higher than those of a lower class competitor.

It is difficult to measure all the greengrocer's 'costs', but the general price level of the 'dear' shop must always be 'in line' with the prices charged by a cheaper shop. The shop with which the author is connected certainly watches its prices in this way.

In the short run, there may be differences in price which cannot be explained by real differences in quality. Even then, however, prices of obviously *identical* products are the same between competing greengrocers in this area. For example, on branded dates, or small packets of branded apples identically wrapped, one greengrocer cannot charge a price higher than one with which a competitor will be satisfied. Here the price of a certain line in one shop determines its price in another.

In the case of the majority of fruit and vegetables, however, price in the short run may be different between a number of rival greengrocers. This may, of course, often reflect quality differences, but not necessarily. For instance, the price of Brazil nuts, apparently the same quality, ranged from 3s. 3d. to 3s. 8d. a lb. But customers have the confidence that the higher quality higher priced shop will be selling better quality nuts than its 'cheaper' competitors (it will be prepared to exchange bad nuts).

The greengrocer recognizes that on certain lines for a short time another shop will be able to sell at prices lower than his: in this area, the multiple shop (C) always sells strawberries cheaper than the independent shops, because the firm of which it is a branch has its own strawberry fields. The small greengrocer admits that he 'cannot compete', and makes no attempt to bring his strawberry prices into line with those of the multiple shop. He refuses to sell at a price which may result in an actual loss: the demand for strawberries is difficult to gauge (especially at the beginning of the season), and their holding costs are high. Consequently, he maintains his prices, even though the multiple shop is selling similar quality strawberries cheaper.

Another case where there is no close local competition, is when the greengrocer is sole seller of certain lines (for example, fish and

rabbits), where his margins will tend to be those he considers right in the long run. Any change in retail fish and rabbit prices will be due to changes in wholesale prices. The greengrocer charges what he considers a fair price: a price which (as mentioned before) has to cover 'prime costs', wastage (holding costs), and has to provide a return for his work. The price is very rarely what the 'market can bear'; small retail margins may result in 'consumers' surpluses', which attach a customer to a particular greengrocer. From the seller's point of view, less than maximum margins may be regarded as a 'cost of increasing goodwill'.

Therefore, while the sole seller will simply retain his fixed retail margins and while prices will have to be identical for obviously identical goods, there is a wide field where prices will vary in the short run. A greengrocer's customer will generally be satisfied, if over the whole range of what she buys, she does about as well from him that day as she would if she had bought from a rival shop. If, therefore, a greengrocer has to lower the prices on some lines in order to clear them he will be able to cover this price reduction by maintaining his prices for other goods; and his reputation for high quality will carry higher-than-'market' prices, in the short run, on goods of only general quality.

This is of practical importance, for it enables the greengrocer to compete with his rivals in some lines, if not all. The greengrocer may ask himself: 'What are the prices of Smith's cauliflowers?' but his final cauliflower prices may not be the same as Smith's. He may not adopt his rival's prices exactly, but merely follow what can be called the 'trend' of pricing, that is, cheaper or dearer. Again, the 100 per cent 'mark-up' on flowers may offset a loss on mushrooms, which deteriorate fairly rapidly, and also lose weight.

This sort of pricing, i.e. some lines cheaper, others dearer than 'market price', points to a policy in the short run of spreading costs over the whole range of greengrocery which he is selling. He does not aim to maximize profits on any one day a week, but only to do as well as he can over the long period. This is reflected also in the fact that a greengrocer does not calculate his earnings on the 'profit margins' for various lines of fruit and vegetables, but takes his gross takings from week to week as a measure of profitability. This may only be approximate, but it provides a guide for day to day policy.[4] In fact, he will never really know whether he has sold mushrooms 'at a loss', or whether he has made a 'profit' on a box of cauliflowers.

[4] If trade is stable, then there is usually a remarkably constant pattern of trade within the week. For example, putting Monday's takings at 100, the rest of the week's takings will tend to run: Tuesday 180-200, Wednesday 100-120, Thursday 160-180, Friday 400-450, Saturday 550-600.

Whenever there are unusually high wholesale costs, the greengrocer must have some flexibility in his margins.[1] There will be some things, which he must sell to keep the goodwill of his market, whose wholesale prices will rise sharply in times of scarcity — for example, lettuces and cauliflowers at Christmas. If he is to sell these he will have to lower his average margin on them, and, since these commodities are also very variable in quality and have high holding costs, his effective margins on them may be greatly reduced at such times.

His normal pricing policy will have to allow for different margins sometimes on the same 'lot' of vegetables. For example, some cauliflowers in a box may be different from others, both in size and freshness. The greengrocer perhaps pays 14s. for 12 cauliflowers (average cost 1s. 2d.), but very often it is impossible to charge even 1s. 2d. for many of them, and a few may be priced at 2s. 4d., others at 10d. The margins on what he sells make up for the cauliflowers he does not sell, except when he has bought at such high wholesale costs that he cannot push up his price sufficiently. If he fails to sell all the cauliflowers quickly, he will be forced to bring down the prices of those he has left. Again, if his competitors' cauliflower prices drop suddenly, the greengrocer may have to sell at a loss in order to sell at all. A competitor will be able to sell better cauliflowers at low prices because he may have bought more recently. Competition in greengrocery is not so much in selling retail, but in buying wholesale. This is very important, and it goes a long way towards explaining retail prices.

3. Competition. There are two aspects of competition in retail greengrocery; one has already been suggested, i.e. buying wholesale. The other is the relation between the greengrocer and his customers. Both topics will be discussed in this section.

The greengrocers, described earlier, are trying to buy more cheaply than each other in the same wholesale market (though a shop may buy a few vegetables from a wholesale 'roundsman'). Each greengrocer is, to a certain extent, hostile to his rivals: for their interests conflict with his, especially when goods are scarce, and the success of his business depends on whether he can get what he wants at the 'right' price, and in the 'right' quantities. If greengrocers do not adopt high-powered retail selling methods, they are extraordinarily aggressive when they buy wholesale.

[1] The shop with which the author is concerned, generally aims at 100 per cent on flowers; 40-50 per cent on apples; and over the whole range of greengroceries it hopes to make 30 per cent gross profit.

The greengrocer buys mainly from only a few wholesalers, and he will buy differently from his competitors. What he buys depends on (1) anticipation of demand,* (2) his purchases over the last few days or even weeks (which determines what he has already got to sell), and (3) the sort of market in which he himself sells. He is well known to the wholesalers, and if he passes a stall a salesman may call out to him: 'What can we sell you this morning?' The greengrocer knows what he wants and he knows the sort of price he wants to pay. 'What are cauliflowers fetching today?' he may ask; being told, he will make a bid of his own.

He may walk up and down the market half a dozen times, arguing about prices, comparing one wholesaler's price with another's, making a note of quality, and so on. Prices, at any one time, are not the same for identical quality goods between different wholesalers. Often, therefore, he can get a bargain: he is free to move from one stall to another, asking prices and trying to 'beat down' the wholesaler. A very good 'buyer', or one who can use odd lots, may well buy most of his vegetables cheaper than other greengrocers.

For example, the greengrocer may ask the price of cauliflowers at one stall, and be told 1s. 4d. each. He examines the cauliflowers and notes their quality. The wholesaler will explain that the price is due to transport charges, and so on, and assert that cauliflowers are 'making' 1s. 4d. all over the market. The greengrocer may then ask at a stall where he is known: there will be no cauliflowers on view, but the wholesaler may say, 'I'll put you 24 in at 1s.' There is no difference of quality (in this case) between cauliflowers at 1s. 4d. (16s.) and cauliflowers at 1s. (12s.): the greengrocer has merely found a cheaper seller. Many of his purchases are random bargains, and often it is low prime costs which ensure the solvency of his business.

To report an actual incident in the wholesale market: the author wanted to buy a box of apples. He looked at a few boxes open on various stalls and asked the price — 'Best, new season's Italian 40s.' and so on. As this seemed too high a price, he tried another wholesaler, whom he asked: 'What can you put them in at?' '39s., rock bottom; it's a good apple.' The author mentioned that he had bought apples cheaper the day before, and made no attempt to buy. The

* The greengrocer takes into account such things as changes in the weather (there is a small lettuce trade on a cold day), and whether a particular line is likely to sell in his 'market', i.e. whether he will be able to 'clear' a bargain on a particular day. At holiday times it is very difficult to estimate demand (Christmas, Easter and Whitsun trade): similarly, at the beginning of the strawberry season, the greengrocer has to guess the amount of strawberries he will sell. In all this, the greengrocer may make many mistakes.

† Further, in so far as the greengrocer has regular connections in the market, he may expect that they will offer him any special bargains they have or shade their price to him.

wholesaler walked away and his assistant came up. He said: 'Ah, apples! He was asking you 37s. for those, wasn't he?' The author said 'Yes', and the box was put on one side for him at that price. This episode points to the fact that the first quotation from a wholesaler may well be a little unreal, and, if a greengrocer buys without bargaining and trying the market, his costs will be higher than those of his more astute competitors.

These two examples show in some measure how prices (for the individual greengrocer) may be determined in the wholesale market. Although gross takings were less in shop A at the end of the second year than at the end of the first, net profits for the two years (on the balance sheet) were almost exactly the same. This was entirely due to skill in buying, for during the first year a woman had bought, and during the second, a man. The wholesale market is a man's world.*

If wholesale prices fall, retail prices will generally fall as well, but for a few days, may be unchanged among the various greengrocers. This is because some of the greengrocers may not have sold all their stock; e.g. they may still be trying to sell tomatoes bought earlier at high prices. This enables the more 'efficient' shops to make a more than normal 'profit'. For example, if one greengrocer manages to 'clear' his tomatoes (by anticipating demand correctly), whilst the other shops are still holding theirs, he may be able to buy a second quantity more cheaply and sell them at the 'market' price. The other greengrocers may have bought carelessly (not paying much attention to small differences in wholesale prices), or they may have bought too much. The greengrocer shows his skill in being able to buy more cheaply than his competitors. As a result his retail prices may be lower, or he may gain by still charging the 'market' price with lower prime costs.

Steady takings (and it has been suggested that gross takings are a measure of profitability) over a long period indicate an equally steady custom. The greengrocer knows his customers mainly by (1) what they spend, and (2) by the regularity with which they come into his shop. Only secondarily does he know them as persons. This is inevitable in the sort of relationship he has with them. Customers, naturally enough, can be divided up into 'good spenders' and 'poor spenders', 'regular' and 'irregular' buyers. They are 'his' customers, he cultivates them, and will go out of his way to satisfy them. There is a link between greengrocer and customer which may be difficult to break.

* The small greengrocer must buy skilfully. For example, if he hesitates between buying six, seven or eight boxes (apples, or cabbages, or cauliflowers), and finally buys eight, but only sells seven, the loss which he incurs is significant. Thus, in order to make any 'profit', he must buy more or less exactly.

This suggests that a customer will only buy at one particular greengrocer's shop. Probably this is true, but it does not necessarily follow from the connection which exists between them. The question 'why do you buy at this greengrocer's shop rather than another?' is met with many different replies. 'I have always come here,' 'I like the greengrocer', 'I live round the corner', 'well, you sell the best stuff in the road', 'they never give anything away at the Co-op', 'I come here for fish, and buy my greengroceries at the same time'. There are as many reasons for coming as there are customers, but when that reason ceases to hold good the customer will go somewhere else.

A greengrocer's 'monopoly', in this sense, is difficult to maintain, and it depends upon his own personality and the satisfaction he gives. He knows that the relationship with many of his customers is precarious.

Why then do people buy from one greengrocer's shop rather than another? Some of the reasons have already been given and it is very likely that a fair number buy from more than one shop — shops in the centre of the town on Saturday afternoons, for example. (There is the case where the customer says, 'I'm still your customer, but I bought strawberries from the multiple shop because they were cheaper and better than yours'.) But generally customers take into account, (1) prices between different shops, (2) the proximity of different shops to their homes (they may buy an odd bottle of vinegar at dinner-time from the nearest shop, but they will walk a considerable distance to their 'regular' shop at the week-end), (3) the quality of fruit and vegetables, and (4) the personality and services which only a particular trader can give. Only the last seems a 'monopoly' element.

Points (1)-(4) are *conditions* of custom: if the price level in one greengrocer's shop is consistently higher than that in another, without any difference in the quality of the vegetables, customers will begin to buy from other shops. The ease with which they move from, say, greengrocer A to greengrocer B is determined by their personal relationship with A (or his assistants). But in any case a shop would never have a higher general price level over a long period. Yet a greengrocer may sell a customer poor quality fruit, or refuse to give credit, and thus lose him (or her) to a competitor. Customers frequently leave a particular shop for reasons such as these; but in many cases their absence over a period is inexplicable.

The theory of monopolistic competition has placed much stress on spatial monopoly: 'the availability of a commodity at one location rather than at another being of consequence to purchasers, we may

regard these goods as differentiated spatially and may apply the term "spatial monopoly" to that control over supply which is a seller's by virtue of his location' (Chamberlin, pp. 62-3). This may be true of a few shops spread out over a wide area, but it does not hold good for six or seven shops (in this working-class district) bunched close together.

First, the row of shops is a 'shopping centre', and second, people here invariably have to pass one or more of the shops before they come to their 'own'. Some greengrocers' 'spatial monopolies' may be no more than a few yards. This is obvious where two shops face each other across a street. The characterististic of this particular area is that people have to move towards the main road through the side streets. In fact, some of the shops have customers who come as far away as two or three miles, passing numerous greengrocers' shops on the way. It is fairly true to say that in this particular area none of the nine greengrocers can rely on his 'spatial monopoly' for custom: people who live next door to him may buy their vegetables from across the street.[1]

To the customer the quality of fruit and vegetables is of vital importance. He is usually prepared to pay a bit more for a better quality cauliflower or tomato. Consequently the 'better-class' shop is patronized by regular customers who insist that their greengroceries should be 'good' quality. 'Where such differentiation exists [i.e. better quality products], even though it be slight, buyers will be paired with sellers, not by chance and at random (as under pure competition), but according to their preferences' (Chamberlin, p. 56). *Quality* differentiation is a powerful factor in splitting up customers between different greengrocers, but this distinction may be 'real or fancied'.

One shop may have a reputation for poor quality goods (shop B, for example). 'It's always been a "cheap" shop', or 'he sells nothing but rubbish'. A shop of this sort attracts a particular type of customer (not always in a lower income group). This customer rarely buys from the 'dearer' shop and then only when the quality of what the 'better-class' shop is offering is so obviously higher. Yet the 'better-class' customer may often buy in the cheaper shop because in certain lines it is able to offer reasonable quality vegetables or fruit at lower prices — e.g. cheap cooking tomatoes.

Where, for any reason, the customer is dissatisfied, the 'new entrant' may provide vegetables and services as an alternative to the customer's 'regular' shop. Does the 'new entrant' make a living in

[1] It is a mistake to emphasize too much the negative aspect of travelling to shop; shopping is itself a positive action and there may be some pleasure in going out to do it.

this way? What are his problems? Can he compare with the well-established shops? These topics will be discussed in the next section.

4. The New Entrant. There are different kinds of 'new entrants'. A grocer may begin to sell a few oranges, cauliflowers and tomatoes. These are mainly for the convenience of his existing customers. His mark-up is small, and the quality of what he sells may be good, but the amount of his sales is not very large. But another 'new entrant' may come in as a 'greengrocer'; he is at a disadvantage, for he has no goodwill (if he opens a shop which before sold something else), and his trade depends upon the number of people who see what he has to offer, and decide to buy. In the short period his trade is based on casual sales, but over a longer period, he may attract and keep regular customers (that is, if he does not go out of business first). His prices are always competitive, but his turnover may be so small (with, therefore, high holding costs) that he will find it difficult to make takings cover costs. He may buy one box of apples, and keep them so long that he must adjust his price to a lower 'market' price, or else let them go bad. Either way, he will lose on them: he does not 'clear' the quantities to make business profitable.

Economic theory assumes that the 'new entrant' is attracted by 'abnormal profits', and the mere fact of his entry reduces them both for himself and for his competitors. The trade then becomes 'normally' profitable. The concept of 'normal' and 'abnormal' profits in relation to retail greengrocery is unrealistic, for it is difficult to know when profits are 'abnormal' and when they are not. The 'new entrant' simply believes that to open a greengrocer's shop is a profitable enterprise; this may be true, but very often his judgment is mistaken. In fact, he will not know whether the independent, well-established shops' profits are high; he supposes that because the owners may have cars they must be. Consequently, he bases his calculations upon hearsay, and upon the optimistic belief that the greengrocery trade is mainly profitable. The district is well-populated, and it seems likely that customers will not be hard to find; in addition, he looks at the other greengrocers' shops in the area and decides that they are 'prosperous'. All the capital equipment he needs is a pair of scales and an artificial grass mat.

He will choose greengrocery rather than anything else for a number of reasons: (i) credit facilities with the wholesalers, (ii) small capital outlay (if the new entrant already has a shop this is negligible), (iii) the possibilities of arbitrary price fixing, and (iv) the fact that no previous knowledge of the trade seems necessary.

At this stage he will not know what sort of 'profits' he ought to be

making: his prices will be determined by those of his rivals, i.e. he will not sell anything dearer than them. He will buy fish from another greengrocer merely to find out the price of his vegetables. Very often he will undercut his competitors considerably; or again he may sell slightly below their prices in certain lines to attract customers. But it is not true to say (nor is it true of greengrocers generally) that he will persistently charge always so as to get maximum profits from day to day. His prices have to shift with changes in 'market' prices: the old established shop may be able to sell apples 2d. a lb. dearer than anybody else (because it has a general reputation for selling better quality), but for the 'new entrant' this is impossible. He will find, after a very short time, that greengrocery is not as 'profitable' as he thought. The 'abnormal' profits which he hoped to make (and even the 'normal' for that matter) are non-existent. Yet he may continue to sell greengrocery even though he is not 'covering' his costs. The husband usually goes out to work and leaves the wife in the business. In this sense his total 'costs' may be reducible.

The success of the 'new entrant' will depend on how well he can take customers away from his competitors. As a result he may cut prices. Chamberlin suggested that a 'deterrent to price cutting is the inference by the consumer that the product is of inferior quality because its price is lower' (p. 107). But it was pointed out earlier that amongst several greengrocers some prices could be higher (or lower) than others for similar quality vegetables: 'best quality' tomatoes, for example, may vary between 1s. 8d. and 2s. 2d. a lb. with no obvious quality difference. A greengrocer cannot help but take some trade away from his rivals if he cuts a few prices: his price-cutting may, in fact, be based on lower prime costs, and there may be no quality difference in what he is selling. Also he is probably content with smaller margins. But in a particular greengrocer's shop the effect of a reduction in price on certain lines (e.g. apples) may diminish their sales for the following reason.

Customers become used to a fixed price for successive boxes of apples over a few weeks or months. If the prime cost of this same brand of apples falls (for whatever reason), customers will assume that the reduced retail price is a sign of poorer quality, and will prefer to buy dearer apples. This is not the same as saying that a greengrocer cannot 'cut prices': in fact greengrocer B often charges coppers less than greengrocer A for similar quality vegetables. But here the customer compares two prices in the same shop and concludes that a price reduction means quality deterioration, so that one may get, for one shop, the temporary phenomenon of demand falling

if the price of one particular commodity is lowered. This sort of comparison, however, cannot hold good between rival greengrocers.

The assumption that 'abnormal profits' are responsible for a 'new entrant' in the retail greengrocery trade must be questioned. For example, at the beginning of 1951 in this working class locality, there were six greengrocers shops (i.e. shops A, B, C, D, E, F). Between 1951 and 1953 there is evidence for saying that a fall in weekly takings was general in all the shops; in some as much as 40 per cent in late 1953 on a mid-1951 figure. This may have been due to a shift in population, or to the fact that many people had increasing hire-purchase commitments, and that there was an increasing variety of goods in other shops, and (as the National Income and Expenditure White Paper seems to suggest) the level of tobacco and drink consumption remained high, even, perhaps, at the expense of food. Whatever the reason for the drop in takings, the greengrocers have been hard-hit. One greengrocer is trying to sell his shop and has gone out to work (F), another (B) has gone out to work and his wife manages the business. Yet early in 1953 a 'new entrant' came into the trade (shop G); in October and November 1953 another two greengrocers opened shops in the same area (shops H and I). All these shops have come in at a time of relatively depressed trade.

It may be that all retail trade (in certain areas, towns or regions) is depressed and that greengrocery is still supposed to be making 'abnormal' profits, but this does not seem to be borne out by the picture of the economy as a whole. It is more likely that for these 'new entrants' greengrocery is a 'sideline': the first entrant (G) had a shop and began to sell greengrocery when the 'pet' business was none too good. The man already had a part-time job in the area whilst his wife looked after the shop; and the second and third (H and I) rented shops when they became empty. It is fairly easy to become a greengrocer (for reasons already suggested), and if a small lock-up shop can be rented it is easier still. Overhead costs (in comparison with the established shop) are low: the established shop may employ an assistant and there may be considerable mortgage payments to meet.

Why then does the 'new entrant' set up shop when his competitors are already finding it hard to pay their way? He may accentuate their difficulties after he has come in, but he would not be responsible for them in the first place. The 'new entrant' may not come into the greengrocery trade because of its 'abnormal' profits, but because it provides (in the case of an existing shop) a relatively easy way of increasing gross takings. A grocer may begin to sell greengrocery

because he finds that his grocery takings have fallen: for him greengrocery is more attractive than, say, boot-laces or washing tubs. Fruit retail margins are arbitrarily fixed, and second, losses may be small. This applies equally well to entrants who rent small shops in the side streets: the man continues to work and his wife looks after the shop. They hope to make good use of the fact that people will always want some vegetables.

But in conditions where the old-established shops are either closing or getting rid of assistants, the prospect for the 'new entrant' is none too good. Yet he is attracted by the character of the trade, i.e. large gross profits and low prime costs compared with some other retail trades. He does not realize that his turnover will be so small that he will have to buy in ones or half-boxes or even then he may have fruit left on his hands (besides the fact that a wholesaler may not sell half a case of anything.) He will inevitably buy too much and his holding costs will be high. If he sells a barrel of grapes, prime cost 80s., he should make 20s. 'profit'; but holding costs may reduce his margin by as much as 75 per cent; on some lines he may actually lose. For these reasons the general price level of the 'new entrant' may not be any lower than that of his established competitors (shop H), but the quality of what he is selling will not be as good for the simple reason that he has kept his stock longer (shop H did in fact close after Christmas 1953).

A 'new entrant' into the greengrocery trade (in the conditions described) can have no advantage over his rivals, even though customers may buy once, unless he is able to sell better quality products at lower prices. Except perhaps in a very few lines this is impossible. Thus the 'new entrant' instead of making large (and alleged) 'profits' will find it difficult to make ends meet.

The role of 'new entrants' is important in some of the welfare analyses which economists have constructed in relation to retail trade: this raises such questions as whether actual competition drives out the inefficient business and ensures the lowest possible prices, and so on. There are too many difficulties in the way of an adequate answer, such as how to identify the 'low cost' efficient shop and, indeed, how to measure 'costs' for this purpose. The author is unable to answer these questions. All that may be said is that prices seem to him to be competitively determined and, although there is ease of entry into the market, the 'costs' of the new entrants do not cause prices to tend to be high enough to cover those costs.

FRUIT AND VEGETABLE PRICES IN A LARGE CITY[1]

by G. R. Allen and M. E. E. Rutherford

In the early spring of 1953 a short inquiry was made into retail prices of certain fruit and vegetables in a large town with much more than half a million population. The aim in collecting these statistics was to arrive at average prices in the town considered as a whole to assist in measuring the retail cost of distribution.

Becoming aware of Mr. Gornall's article, it appeared to the writers that these statistics could be used as the basis of the following note to complement Mr. Gornall's study. The purpose is to inquire whether, in a large retail market supplied predominantly from one wholesale market, retail prices varied much as between various parts of the market area—particularly whether they varied according to the distance from the wholesale market and whether prices were influenced by the physical or social characteristics of the various residential districts.

Price data were recorded by women field workers, acting as personal shoppers, for four items — grapefruit, rhubarb, new potatoes and spring cabbage — the information for each shop being such as could be easily carried in the head of the investigator for the short period between leaving the shop and recording it. In addition to the price per grapefruit and per lb. for the other items, the following quality points were noted: in the case of grapefruit, whether standard or Jaffa quality; for rhubarb, whether forced or garden standard; and generally any comments to indicate the degree of freshness of the items. The number of assistants serving in the shop, the main commodities being sold apart from fruit and vegetables, and comments on the orderliness and cleanliness of the shop were required.

A sample of 262 shops was selected to be geographically representative over the whole city, and returns were filled in for 237 of the sample. The main reason for the discrepancies was that some of the 'shops' did not exist. Addresses taken from the trade lists turned out to be private houses, presumably occupied by fruiterers and greengrocers; other shops were no longer functioning, and lack of time prevented a few being visited. There is no reason for doubting that the recorded results are geographically representative.

As a check on the importance of recording errors, some investigators were given visiting lists which duplicated those of the remainder, so that for 23 shops two independent sets of records were obtained. Out of 72 comparable items, 14 price differences were found, 3 for

[1] The statistics on which this study was based were collected in a survey organized and executed by Mr. R. A. Dudman and Mrs. M. E. E. Rutherford.

grapefruit, 3 for rhubarb, 3 for potatoes and 5 for spring cabbage. In 12 cases the prices recorded by the checking investigators were lower than those of the other field workers, the main reason being probably that the check investigator reached the shops concerned later in the day (Monday) so that there was greater time for old stock to be marked down from its week-end price. Since the main subject of inquiry is relative price levels between different shops, the fact that any recording mistakes seem to be in the same direction means that errors may tend to cancel.

One important adjustment has been made to the statistics before they were analysed, in order to remove as far as possible the effect on prices of quality differences between various shops. Although, as Mr. Gornall's argument implies, this is an unjustified procedure when comparing competition between shops which are close together, it appears more legitimate when making inter-district comparisons. The aim is to exclude inter-district price differences which arise solely because particular districts consume the various grades of a commodity in differing proportions. Where a shop sold only Jaffa grapefruit the price was reduced by a penny to give the likely price at which the shop would have sold ordinary quality stock. Similarly, where only rhubarb of ordinary quality was sold, 3d. was added to the price per lb. to estimate the price at which forced rhubarb would have been sold. These differentials have been suggested by the prices ruling in shops selling both grades of stock.

The statistics have been analysed into six districts according to distance from the wholesale market and to density of population, as shown in Table 1. One district was treated separately because it was much further from the market than the other residential areas and because its development on the lines of a garden city suburb might place it in a social group of its own. Table 2 presents a similar analysis of the price statistics before carrying out the adjustment described above.

In order to get some indication of the mean price at which the commodities were bought by purchasers as a group, each shop price should be weighted according to that shop's total sales. As a measure of these sales, the number of observed workers in the shop was used. The limitations to this procedure are obvious. For example, there is no means of distinguishing part-time and full-time workers. Some shops sold only fruit and vegetables, so giving more intensive employment in selling these lines than other shops where other items were sold in conjunction with fruit and vegetables. However, 'unweighted' means of the shop prices were generally very close to the means derived from weighting according to estimated turnover.

Table 1 gives the weighted means; where the two means differ by more than ½d., the unweighted mean is shown in brackets. The quartiles have been calculated after excluding shops where the quality has been recorded as poor, and are, therefore, more reliable than the mean prices as a measure of the price differences between districts arising because of variations in quality.

As will be obvious from the short descriptions of the areas given in Table 1, as one moves outwards, excluding the City centre, one reaches districts where the average income per head is likely to be higher and where shops would be more geographically separated from their competitors, owing to the lower density of population. It is true that both Table 1 and Table 2 show a tendency for mean prices to rise as one proceeds further from the market and towards the less densely populated areas. The change seems mostly associated with rising rhubarb and cabbage prices and might be explained solely by quality changes. The quartiles, as noted above, give more suitable comparisons, and those from Table 1 are summarized below.

AVERAGE OF QUARTILE VALUES (IN PENCE) FOR ALL ITEMS BY DISTRICTS

	Districts					
	A	B	C	D	E	F
Lower quartile	8	$7\frac{5}{8}$	$7\frac{3}{4}$	$7\frac{5}{8}$	$7\frac{3}{4}$	8
Median	$9\frac{3}{4}$	$8\frac{1}{8}$	$8\frac{1}{4}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$
Upper quartile	11	$8\frac{3}{4}$	$8\frac{7}{8}$	$9\frac{3}{8}$	10	$9\frac{1}{2}$
Difference between Lower and Upper quartile	3	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$1\frac{1}{2}$

Although a quarter of the shops in the City centre sell at prices as low as the cheapest shops elsewhere, the prices in the remainder range up to much higher values, which may in part reflect a 'degree of monopoly'. For the other five districts prices rise very slightly as one moves outwards from the wholesale market, as shown by the lower quartiles and the medians. The increase could, in all probability, be explained by the extra collection costs incurred by the greengrocers who are more distant from the market. The upper quartiles increase more with distance. This may reflect the selling of a greater proportion of quality goods, and therefore a larger number of quality shops, in the districts with higher incomes per head.

The result of this note is, therefore, to support Mr. Gornall's contention that 'spatial monopoly' is not a significant factor in the retail selling of fruit and vegetables.

AGRICULTURAL ECONOMICS RESEARCH INSTITUTE,
OXFORD.

TABLE 1

AVERAGE PRICES (IN PENCE OR SHILLINGS, AS APPROPRIATE, PER LB. FOR ALL ITEMS, EXCEPT GRAPEFRUIT)

	No. of shops	*Average No. of Assistants per shop*	GRAPEFRUIT *Mean Price*	*Median Price*	*Lower Quartile Price*	*Upper Quartile Price*
A. City Centre	18	2.7	6½	5½	5	7
B. Other Districts with 60 or more persons to the acre and within one mile of the market	34	1.2	5½	6	5	6
C. Other Districts with 60 or more persons to the acre and over one mile from the market*	149	1.5	5½	6	6	6
D. Districts Under 60 persons per acre and less than 3 miles from the market	16	1.4	5½	6	5	6
E. Districts Under 60 persons per acre and over 3 miles from the market (excluding garden suburb)	19	1.5	6½	6	5	7
F. Garden suburb, over 4 miles from the market	11	2.4	5½	6	6	6

FORCED RHUBARB *Mean Price*	*Median Price*	*Lower Quartile Price*	*Upper Quartile Price*	NEW POTATOES *Mean Price*	*Median Price*	*Lower Quartile Price*	*Upper Quartile Price*	SPRING CABBAGE *Mean Price*	*Median Price*	*Lower Quartile Price*	*Upper Quartile Price*	'BASKET'† *'Un-weighted' Mean Price*	*Mean Price*
1/0½ (11½)	11½	9	1/3	10½ (9½)	10	9	10	11½	1/–	9	1/–	8/5	8/9½
9	9	8	9	8½	8½	8½	10	9½	9	9	10	6/10½	6/11½
8½	8	8	9	9½	9	8	9½	9½	10	9	11	6/11½	7/–
9	9	8	9½	8½	9	8½	10	10	10	9	1/-	7/2	7/1½
9½	9	8	11½	9½	9	9	10	10	10	9	11½	7/5½	7/5½
9½	10	9	10	8½	8½	8	10	10½ (10)	9	9	1/–	7/4½	7/5½

* Usually within 3 miles of the centre.

† The 'basket' comprises 2 grapefruit, 3 lb. rhubarb, 2 lb. new potatoes and 3 lb. cabbage. The 'unweighted' mean price for the 'basket' uses the simple mean prices for the individual commodities. The other average uses the weighted mean prices.

TABLE 2
AVERAGE PRICES, NOT STANDARDIZED AS IN TABLE 1

		GRAPEFRUIT			
		Mean Price	*Median Price*	*Lower Quartile Price*	*Upper Quartile Price*
		pence each			
A.	City Centre	7	6	5	8
B.	Other Districts with 60 or more persons to the acre and within 1 mile of the market	5½	6	5	6
C.	Other Districts with 60 or more persons to the acre and over 1 mile from the market	6	6	6	6
D.	Districts under 60 persons per acre and less than 3 miles from the market	5½	6	5	6
E.	Districts under 60 persons per acre and over 3 miles from the market	6½	6	5	7
F.	Garden suburb, over 4 miles from the market	5½	6	6	6

	GARDEN RHUBARD				FORCED RHUBARB				'BASKET'			
	Mean Price	*Median Price*	*Lower Quartile Price*	*Upper Quartile Price*	*Mean Price*	*Median Price*	*Lower Quartile Price*	*Upper Quartile Price*	*'Unweighted' Mean Price*		*Mean Price*	
	pence per lb.				*pence per lb.*				*s.*	*d.*	*s.*	*d.*
A.	6	6	6	6	10½	10	9	12	7	7	7	10
B.	5½	6	5	6	8	8	8	8	6	4½	6	5
C.	5½	5	4	6	8½	8	8	9	6	7	6	7½
D.	5½	6	5	6	8½	9	8	9	6	9½	6	8½
E.	5½	6	5	6½	8½	9	8	9	6	10½	6	11
F.	6	6	6	7	9½	9	9	10	6	11	7	0

NOTES: As for Table 1, except that the mean of the two prices for rhubarb have been used in calculating the price of the 'basket'. Also, rhubarb of unspecified grade but 8d. per lb. or over has been assumed to be 'forced'. Potato and cabbage prices used for the 'basket' are the same as in Table 1.

SOME REMARKS ON NUCLEAR POWER ECONOMICS

by BRAM DE BOER and M. BOGAARDT

Introduction. Nuclear energy is now developing at high speed into a matter of general industrial interest. A definite judgment about the economic importance of nuclear energy will not be possible before a large amount of research, mainly technical research, has been done. It is the purpose of this article to explain what factors will, in the first instance, determine when and where application of nuclear energy will be justified. We shall postulate that the nuclear fuel will replace the conventional fuels as a heat source, the conversion from heat into industrial energy remaining essentially unchanged. This means that, e.g. in a power plant the application of nuclear energy will only affect the fuelling of the furnace; the turbine-generator part of the plant remains unaffected. The reason for stipulating this fact explicitly here is the following:

The military efforts in the field of atomic energy have led to the construction of a special type of nuclear reactor in which a particular quality of fissile material for military purposes is produced. The result of this has been an extremely rapid expansion of our knowledge of many fundamental constants which are of primary importance for the application of nuclear energy. Furthermore, a very fast development was induced in the field of some auxiliary sciences, such as chemistry, metallurgy, electronic cybernetics, etc. Such a rapid development would hardly have been possible under other than war time conditions. However, due to the single track development inherent in those conditions, it is at present far from certain that we have obtained a complete survey of the fundamental possibilities of extraction of the energy which is stored in the atomic nucleus. The application of nuclear energy as a fuel to replace coal for heating the furnaces may be compared with the use of gasoline for steam production instead of as a fuel for internal combustion motors.

The incompleteness of our knowledge of the possibilities of the use of nuclear energy might lead to a misinterpretation of the economic importance of the energy of the atomic nucleus. The situation is similar to that which existed in the early days of electricity. There was, at that time, no extensive market for electricity. Likewise, nuclear energy itself will probably create the needs which it can meet. In a study just published, Palmer Putnam,[1] adviser to the American Atomic Energy Commission, uses as a working-hypothesis, that

[1] Palmer Putnam, *Energy in the Future*, van Nostrand Pub., New York, 1953.

atomic energy will be produced in the the form of electric energy only. He calculates that necessarily 60 per cent of the energy supply must be taken over by nuclear power by the year 2050. To conclude from this that the pattern of energy consumption thus has to change into the direction of 60 per cent electrical energy is premature. The change, which surely will take place, may also influence the way of using energy, e.g. it may result in the creation of new industrial processes using nuclear fuel in a way which agrees better with its special character than we at the present time consider possible.

The situation today. The solar energy which reaches the earth and is subsequently conserved by nature, is used by mankind in a form which is dependent upon the common economic considerations such as are determined by geographical location, presence of natural energy sources, costs of fuel transportation, etc. The choice between the various possibilities thus tends to be directed towards the source of energy which from an economic point of view is the easiest accessible one. This is, in itself, quite natural — it is, actually, the common economical way — but it may lead to a dangerous situation in the long run. The easiest accessible, that is the cheapest, source of energy is often fossil fuel, coal and oil, and the result is that we at present are using the reserves of these fuels at a rate which is a million times greater than that at which they are formed by nature. In this way we are rapidly using our stock of capital-energy which is far from unlimited; the income-energy, however, i.e. direct solar energy, can at present not be utilized in any artificial way which is economically justified. The only way in which income-energy is being used at a proper rate, albeit in the form of delayed income-energy, is the one applied in the production of hydro-electric power.

Nuclear fuel is a fuel which has no direct connection with solar energy. From an economic point of view, it is nearest to fossil fuel. The conversion cost of direct solar energy would at present be about 40 times higher than that of coal, while the cost of nuclear energy may, at present techniques, be calculated to be about twice as high as that of conventional fuel.

Although the supply of direct solar energy is practically unlimited whereas the total amount of nuclear energy available is difficult to predict, it is evident that we will be forced to make use of nuclear energy during the period in which conventional fuel becomes scarce and direct solar energy cannot be depended upon for maintaining the current standard of living. Further arguments for the use of nuclear energy may be the fact that from a technical point of view, the realization of nuclear energy is much more advanced than that of direct solar energy, and that, as has already been pointed out,

nuclear energy may find other and wider applications than the few that have become apparent up to now.

Reserves and future demand. How long shall we be able to maintain our standard of living, only using the sources of power now in use?

There are many different opinions with respect to this question. It is not our intention to take part in the discussions about this matter, we only want to give an impression of the state of affairs. About 40 years ago, it was calculated that world coal reserves would be of the order of magnitude of 180 Q,[2] that means about fifty times the total energy consumption between 1850 and 1950. Even assuming that this amount of coal, representing 180 Q, could be mined economically, the situation would be less hopeful than it looks at the first view. For the world population increases at an ever growing rate and so does the total energy demand. The total energy consumption of the world up to 1850 has been about 6-9 Q, while during the hundred years following about 4 Q was consumed and if we extrapolate this energy consumption, as Palmer Putnam does in his study mentioned above, the world consumption will reach the value of about 10 Q during the period between now and the year 2000, and even 70 Q during the 50 years following.

Another conclusion of Palmer Putnam makes the situation look still more pessimistic. He states that the estimate of 180 Q for coal reserves is about 6 times too high; this means that the right number would be about 30 Q. He takes into account not only the results of more recent geological investigations carried out in the years between, but also the fact that for maintaining our standard of living, only those reserves may be taken into account which can be mined at not more than twice the present costs.

As far as oil is concerned, its relative influence on the whole is rather small; within a hundred years all of it will probably have been consumed if we continue using it at the present rate. Also waterpower will soon reach its maximum capacity; this source will of course continue to supply energy, even at low cost, but with respect to the total demand it will hardly play a role as a contribution to the solution of the energy problem.

This means that we must look for supplementary sources of power to take over a part of the energy production within one generation. The quantitative numbers of reserves and demands must, of course, be taken as very rough estimates. It is, e.g. very difficult to know whether a special coalfield will be able to supply coal at costs below a certain fixed amount during the next fifty or hundred years. Other details of Putnam's studies will surely be a matter for discussion or

[2] (1 Q = 10^{15} BTU = ca. 252×10^{15} cal.).

closer investigations. For our purpose it is enough to conclude from the order of magnitude of the numbers given that our reserves of conventional fuel do not enable mankind to continue living at the present standard for hundreds of years to come. Direct Solar energy not yet being developed so as to be an economical alternative to consumption of 'capital' energy, and the reserves of nuclear fuel being at least 580 Q, we are dependent upon the nuclear reactor as a solution for the energy problems of the near future.

The nuclear reactor. The nuclear chain-reaction is based on the fact that a certain elementary particle, the neutron, is able to induce nuclear fission in some types of atoms, the so-called fissile atoms. It is essential that, apart from the fission-energy, which is transformed into heat, at least one new neutron is liberated in order to carry on the fission process in other nuclei of the same type. The current types of fissile nuclei are uranium 235 and plutonium 239. The former gives off an average of 2.5 neutrons per fission, the latter 3.0 neutrons. One of these neutrons is thus used to carry on the fission process, whilst 1.5 neutrons as an average in the case of uranium are available for other purposes.

Natural uranium consists of one atom of uranium 235 for every 139 non-fissile uranium 238 atoms; in a reactor in which this mixture is used as a fuel, some of the neutrons are used for transforming the non-fissile uranium 238 atoms into fissile plutonium atoms. In a nuclear plant of common design, about 8 plutonium atoms are formed for each 10 uranium 235 atoms used. In principle, however, it would be possible to form more than one, actually 1.5 plutonium or other fissile atoms per uranium 235 atoms used. In this case, more fissile atoms are being produced than used. A plant in which this is the case is called a *breeder-plant*, and the type has actually been realized in the United States. This means that not only the uranium 235 can be used, but that the originally non-fissile uranium 238, which is 139 times as abundant as uranium 235 in natural uranium, may also be burnt in the nuclear furnaces. The importance of this fact is not only that the natural resources of nuclear fuel are multiplied by a factor of 140, but also that it may be possible to reduce the cost of the fuel.

When fission occurs, the fragments of the original nucleus remain in the nuclear fuel. These fission-products pile up in the fuel elements and they will tend to capture neutrons in a wasteful manner. The nuclear reactor thus becomes 'poisoned' by fission fragments, which necessitates reprocessing of the fuel. Reprocessing costs are still very high. Future development of the economic aspects of nuclear energy depends to a very large extent upon the reduction of the costs

of the chemical reprocessing of the nuclear fuel. It seems, in any case, that the investment necessary for reprocessing plants is of such a nature that one chemical plant has to serve a number of nuclear energy plants.

Nuclear reactors may, for the purpose of discussion, be divided into three classes:

1. Reactors in which the fast neutrons released upon fission are forced to give off their energy by colliding with light atoms, such as those of graphite or heavy-water. The neutron energy is thus very much reduced before the neutron is able to induce a fission in the next fissile atom. This type of reactor is called 'thermal' reactor. Reactors with heavy-water as a neutron moderator are relatively small in size, but they require a large investment in heavy-water, a most expensive material. The use of graphite tends to increase the size of the reactor considerably and, in any case, brings the total investment up to a high level.
2. Intermediate reactors, in which the neutrons are forced to give off a large deal of their energy before inducing the next fission.
3. Fast reactors, in which the neutrons produce new fissions before they have lost much of their initial energy. In this type of reactor no investment in moderator material is needed, but a considerable amount of money has to be invested in fertile material, that is material which, by neutron capture, may be transformed into fissile atoms, e.g. uranium 238. Furthermore, the core of such a reactor has to contain the very expensive pure fissile material, which again means a reasonably high investment in initial fuel. The possibility of constructing this type of reactor so as to be a breeder, and the resulting possibility of a high rate of burning up fuel, makes this type of reactor a most promising one for the future. We will revert to this point later.

Characteristics of nuclear power. An important difference between the energy from conventional fuel and that liberated from the atomic nucleus is that the latter is of a much higher order of magnitude than the first.

This means that the release of nuclear energy results in a much higher energy-output per unit of fuel weight than is the case with conventional fuel. The price of conventional energy in different parts of the world is strongly affected by the transportation costs of the fuel. The negligible weight per energy unit of nuclear fuel will therefore prove to be an important factor with respect to the differentiation in the energy price as a function of geographical location. It will, in fact, reduce the transportation costs of fuel to almost zero. In under-developed areas, where the price of energy from a coal

generated plant is about twice the price of energy in the United States, the difference would be far less if not negligible in the case of nuclear energy. This makes nuclear power especially attractive for countries to which coal has to be supplied from distant coal mines. It is worth while mentioning in this connection that two power generating stations fed by nuclear fuel are going to be constructed for use on Greenland.

Another conclusion to be drawn from the previous section is, that there are different ways of using fissile materials for the production of energy; thus it would be a sheer coincidence if the type of reactor which gives the optimum condition for power-production would be just the same as the one giving the best opportunity for production of fissile material, or especially, weapon-grade plutonium. As mentioned before, history made the parallel development of power- and plutonium-production unavoidable, but it is questionable whether it is right to enforce a combination of power-production and plutonium-fabrication. The cost-price-formula will show that it may be possible to produce economical power when plutonium can be sold to the government, for instance on the basis of a five-year contract. However, analysing the different aspects it will become clear that this is not an acceptable approach to nuclear fission as an industrial source of power.

The cost of nuclear power. The cost of nuclear power per kWh consists of a series of terms, (I), representing the investments, e.g. in the plant, the moderator if present, the bulk of fuel, etc., and those representing the annual costs, (c), e.g. running costs, reprocessing and replacing fuel, labour, etc. Thus the cost is built up of an investment term, being the sum of a series of terms $a_i I_i$ divided by the annual production. I_i being the investment in the i^{th} production factor, and a_i the fractional part hereof to be reserved each year for amortisation, interest, etc., the other term consists of the annual cost terms c, also divided by production per annum. Thus the cost can be expressed as:

$$\frac{\Sigma a_i\ I_i + \Sigma c}{\text{annual production}}$$

For the purpose of comparing costs for nuclear energy with conventional power costs, we may give a rough estimation of the order of magnitude of the different terms.

As a first approximation, the investment in that part of both the old and the new type of plant, which is the same, i.e. the turbines and related installations, will be about £2.5 million for plants with a name-plate capacity of 100,000 kW. The part of the conventional plant to be replaced by a reactor will cost about the same, whilst the

investment in the corresponding reactor will amount to about £10 million. This means that, assuming the same amortisation period, the total investment required by nuclear power will be about 2½ times that for conventional power. For a coal generated plant it will be about 0.04 pence, for a nuclear plant about 0.1 pence per kWh. It is unrealistic to hope that this amount can be decreased by assuming very long amortisation periods. It is, in this connection, interesting to mention a statement often made by physicists working in the field, namely that the high investment for heavy-water as a moderator hardly requires an amortisation at all, if not a very long one, because it is not consumed or deteriorated by the nuclear power generating process; thus it would keep its value. This is not in accordance with economic practice. Amortisation does not necessarily account only for loss of value due to deterioration of the production factor, but it is, too, a guarantee against the possibility of loss of value due to further technical development. This might make the combination of production factors of which the one considered is a part, out of date. When there is no alternative use for this part, as may be the case for heavy-water, such a development would make the material less valuable, though it has maintained its original quality.

To come to the optimum combination of the production factors mentioned in the technical introduction, especially with respect to future developments, we may have a look at fuel costs. They are present in both I- and c-terms; one of the I-terms represents the bulk of fuel, whilst the c gives the annual charge and processing costs. For a coal generated plant the cost of fuel is about 0.2 pence per kWh, for nuclear fuel the annual charge and processing amounts to about 0.1-0.5 pence per kWh.[3] No more than approximately one-hundredth to one-fourth of total fuel costs, depending upon the rate of burn-up, is on account of the original fuel. This means that the processes the fuel must undergo make fuel costs high. As mentioned above, reprocessing costs are so high that one chemical processing plant has to serve more than one power-plant. Here lies a real possibility for lowering costs. The largest margin for decrease of costs lies, of course, in the highest possible use of the production factor for which a decrease in price is the most probable. As the fast reactor is probably the only one that can be constructed so as to be a 'breeder', the type for which processing costs are relatively high with respect to the negligible costs for fuel supply, it seems at present that this type of reactor is, from the economic point of view, the most promising one.

Some general rules may be derived from our present knowledge

[3] Prices given are calculated from American data, and only mentioned to give the order of magnitude.

with respect to the future possibilities of different types of reactor. As an illustration, we can give some general rules for the three types of reactors.

The fast reactor will certainly have a future especially when co-ordination makes lower processing costs possible. The thermal reactor will probably be remunerative in comparison with the breeder, if e.g. the price of heavy-water is decreased considerably.

Reactor types using cheaper — but less efficient — moderator materials, as e.g. graphite, will be attractive when prices for natural uranium are so low that one would prefer a cheap moderator together with more uranium than heavy-water with less uranium. Alternatively, heavy-water producers will have to decrease their price at the proper rate with the uranium price.

It may be emphasized that these rules are only reliable with respect to the direction of possible movements in the short run; scientific and technical developments may change circumstances and thus influence the interest in the different ways of constructing nuclear reactors. One of the c-terms will have a negative sign, representing the earnings as a result of the sale of by-products, e.g. radio-active elements, or in the case of a breeder, the sale of secondary fuel, e.g. plutonium. The sale of radio-active materials and the earnings from irradiation of substances in the pile, though possibly promising from an industrial point of view, will not be considered here. A more important matter is the market-production of fissile materials. A-bomb-production has made plutonium-production much more attractive than it would be if the demand for plutonium only came from the power-producing nuclear industry for use in fast reactors. The high price for weapon-grade plutonium, combined with the important influence of amortisation on the price of power, makes it possible to produce nuclear energy at the same, or a lower price, than conventional energy, in the first instance during a five-year period in which plutonium earnings are used for amortising the whole investment. After this period the absence of the amortisation on the budget makes a continued cheap power-production possible. This scheme for financing nuclear energy production has actually been proposed in the United States as a way of starting the industrial production of nuclear power until the demand for atom bombs has been satisfied. As a kind of support to industries for developing a new way of production, which must be brought to the stage in which it is able to pay for itself, this subsidy would be justified. Thus, even the argument that the taxpayers' money is used for this purpose is not the best one against this way of starting industrial power-production from the atomic energy. However, the weapon-grade plutonium

must meet specifications different from those existing for plutonium for power-producing purposes. It would be a drawback for reactor designers to be forced to reckon with those claims which make the reactor different from the optimum type in the case of a power-only nuclear industry.

Conclusions. Some general concluding remarks may be made about the practical consequences of the economic side of nuclear energy generation. In the first place it will be clear that, even when the calculated price would show the possibility of producing competitive nuclear power, the investment would be very high. This presents a difficulty for small countries such as those in Western Europe, and poor countries such as those in Asia. For the latter, the small difference in price between nuclear power in different parts of the world would make nuclear power very attractive, since the conventional power position of these countries is unfavourably affected by the high transportation costs of fossil fuel. This points in the direction of the necessity of international co-operation. Chemical processing, especially, as the most capital-absorbing part of the whole, will require co-ordination. In the first instance this means that small countries will send their fuel elements to countries with a more developed nuclear industry, whilst in future the smaller countries will have to join in order to make the processing costs decrease. With respect to the difference in price between conventional power and nuclear energy as a restraining factor in the development, a correction may be justified in the form of a subsidy equal to the difference between costs per kWh and the official price of energy. In countries where power-production is a governmental enterprise, society as a whole has to bear this burden as a kind of guarantee for maintaining its living standards; in countries where private enterprise takes a part in power-production, or in the case of industries which produce their own power supply, the investment may be seen as a premium for keeping up to date. For large industries, which pay about 10-20 per cent of their annual costs for power-generating, this difference will not be a great matter, moreover the sacrifice will pay in the future.

JOINT ESTABLISHMENT FOR NUCLEAR ENERGY RESEARCH,
KJELLER PER LILLESTRØM,
NORWAY.

PUBLICATIONS RECEIVED

The American Economic Review, Vol. XLIV, No. 1, March 1954; No. 2, May 1954, Papers and proceedings of the American Economic Association, and No. 3, June 1954.

The Controller, U.S.A., May, June and July 1954.

The Cost Accountant, London, Vol. 32, No. 12, May 1954; Vol. 33, Nos. 1 and 2, June and July 1954.

The Department Store, by H. PASDERMADJIAN, Newman Books, London, 1954, 16s.

Economic Abstracts, No. 11, Graduate School of Arts and Science, New York University, Vols. 11-14, February 1954.

Economisk Tidskrift, Vol. LVI, No. 2, June 1954.

Explorations in Entrepreneurial History, Research Center in Entrepreneurial History, Harvard University, Vol. VI, No. 4, May 1954.

Financing Agriculture through Commercial Banks, Federal Reserve Bank of Kansas City, 1954.

Journal of the American Statistical Association, Vol. 49, No. 265, March 1954, and No. 266, June 1954.

Leading Problems New Jersey Manufacturing Industries 1953, Division of Business Research, School of Business Administration, Seton Hall University, 1953.

The Management Review, American Management Association, March, April, May, June and July 1954.

The Quarterly Journal of Economics, Vol. LXVIII, No. 2, May 1954.